JULY 1955

chemical processing

For Men who Manage

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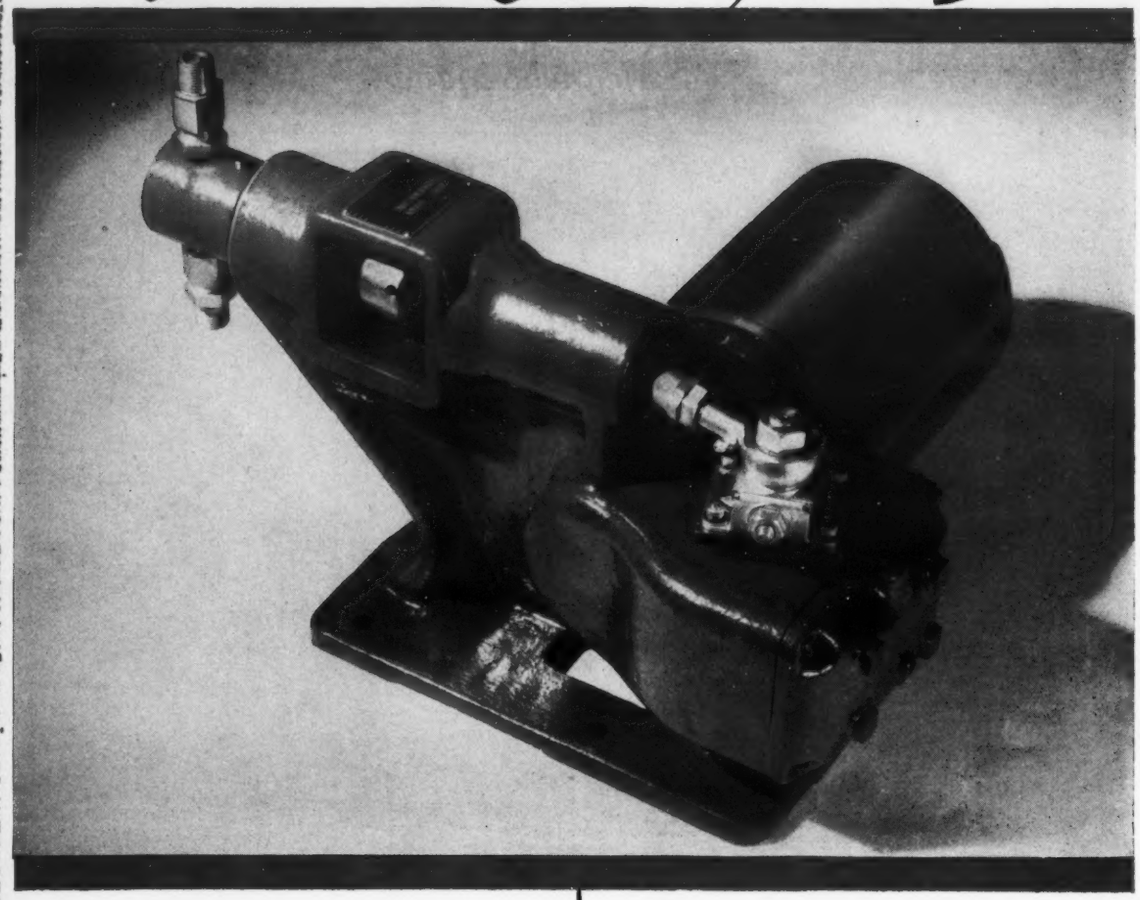
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corrosion control



PITTED PIPES
typify a big industry problem. For aids in battling corrosion see section starting page 51

Look!



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B. F. Goodrich Chemical's Geon is the coating, and the Car Castle itself is manufactured by Domestic Film Products, Dept. CP, Millersburg, Ohio.

One man controls huge steel press

By pushing buttons on a control panel, one man can control the operation of a 1½-million-pound steel press which is capable of straightening steel plate nearly two feet thick.

The press, designed by Clearing Machine Corp., will be used by Lukens Steel Company principally for straightening armor plate for naval vessels. Sensitivity of controls permits "flattening" of a plate 20" thick, 50" wide, and 14' long to within a ½" tolerance.

Yellow dyestuffs for yellow pages

Since annual US production of yellow pages for phone books is about 30,000 tons, and one pound of color is needed per ton of pulp, about 30,000 pounds of dyestuff go into the pages (it figures). (*Dyelines and Bylines,* American Cyanamid Co.)

(*Continued on page* 195)

For more information on product at left, specify CP 7844 . . . see information request blank opposite last page.

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 18 July, 1955 No. 7

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Over the editor's shoulder



I'm a F.I.S.H.

Having just attended the Third Annual Chemical Group Corrosion Conference conducted by the International Nickel Company at Kure Beach — Harbor Island, North Carolina, makes me a F.I.S.H. (Fellow of the Institute of Sea Horses). Here Inco is doing a masterful job of disseminating information on corrosion control problems.

The marine corrosion stations were established in 1935 as a means of providing test data on marine corrosion. A logical follow-up to the program of establishing the stations came about in the form of a series of "bull sessions" to discuss various corrosion problems. Here were discussed unique experiences that became a factor in the breakdown of secrecy and sharing of corrosion data.

While early meetings were impromptu, now Inco has an established program of meetings at the Sea Horse Institute directed to the Petroleum, Railroad, Power, Boating, Marine, and the Chemical industry.

One might think because the station is located at Wrightsville Beach, North Carolina that attendance at this session would be mostly recreational. This isn't so.

Sessions start early in the morning and carry on until late in the evening under the able direction of Frank L. LaQue, Vice President and Manager, Development and Research Division.

To one who has become bored with many formal talks given by poorly trained speakers, the question and answer technique used at the Sea Horse Institute becomes refreshing and unique. Prior to the meeting, questions are developed through a survey made among an interested group. These questions then become the nucleus for the program and qualified persons volunteer to take part in the question and answer period.

Those interested in the corrosion control problems in the chemical processing field freely exchange experiences and anyone having the opportunity to attend such a session comes away well rewarded.

In this issue of CHEMICAL PROCESSING, we're presenting again a feature on Corrosion Control (see page 51). The stories appearing here have been developed through contact with the field on corrosion problems. This is the second of our "features" on this subject and will appear regularly each year.

John C. Vaaler

EDITOR

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THIS MONTH'S COVER

Pitted pipes shown on this month's cover symbolize corrosion and its tremendous cost to the chemical industry. You can find a way to cut your corrosion losses from information presented on pages 51-103, where CHEMICAL PROCESSING spotlights its regular section on Corrosion Control.

Convention and Exhibit Schedule

Association & Society addresses appear on page 184

July 13-15. Western Plant Maintenance Show, Pan Pacific Auditorium, Los Angeles.

July 25-27. Conference on Systems Engineering, field of automatic controls, Purdue University, Lafayette, Indiana.

Aug 8-19. "Low-temperature Engineering & Research", Special Summer Program, Massachusetts Institute of Technology, Cambridge, Mass.

Aug 24-26. Western Electronic Show & Convention, Civic Auditorium, San Francisco.

Sept 6-17. Production Engineering Show, Navy Pier, Chicago.

Sept 11-16. American Chemical Society, 128th National Meeting, Minneapolis.

Sept 12-16. Instrument Society of America, 10th Annual Conference & Exhibit, Shrine Exposition Hall, Los Angeles.

Sept 14-16. National Petroleum Assn., Annual Meeting, Traymore Hotel, Atlantic City.

Sept 22-23. Chemical Market Research Association, The Cavalier, Virginia Beach, Va.

Sept 22-25. American Assn. of Textile Chemists & Colorists, Atlantic City.

Sept 25-28. American Institute of Chemical Engineers, Lake Placid Club, Lake Placid, N.Y.

Sept 28-30. Technical Assn. of the Pulp & Paper Industry, Sixth Testing Conference, Sheraton-Kimball Hotel, Springfield, Mass.

Oct 3-5. Federation of Paint & Varnish Production Clubs, 33rd Annual Meeting, The Hotel Statler, NYC.

Oct 3-5. 20th Paint Industries' Show, New York City.

Oct 5-9. World Plastics Fair & Trade Exposition, National Guard Armory, Los Angeles.

Oct 17-21. 43rd National Safety Congress & Exposition, Chicago.

Dec 5-9. 25th Exposition of Chemical Industries, Commercial Museum & Convention Hall, Philadelphia.

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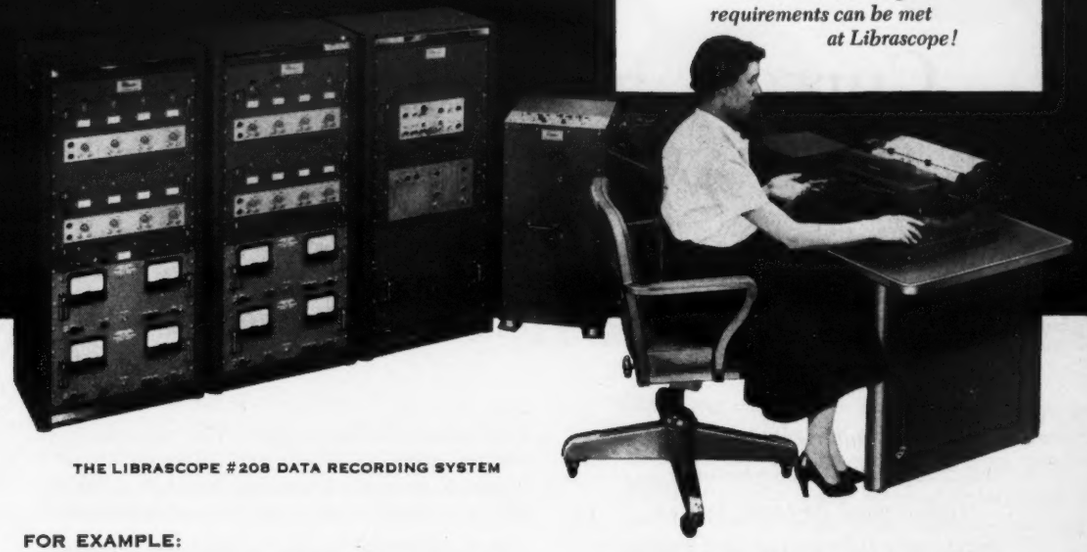
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Our Guest Editor obtained his Bachelor of Science degree in Chemistry from Norwich University in 1930. Prior to employment with Monsanto, he was with the Du Pont Company for 18 years in various capacities. During World War II, he was Chief Engineer, Engineering Group, on two Du Pont-operated smokeless powder plants. His present position is Corrosion Consultant, Research and Engineering Division, Engineering Department, Monsanto Chemical Company.

Mr. Whitney has long been active in the affairs of the National Association of Corrosion Engineers, serving as Vice President; member of the Executive Committee; Director, North Central Region; and Chairman, Greater St. Louis section.

In addition, Mr. Whitney has been active in developing and participating in the Corrosion Short Courses, and presents a course in Corrosion Technology at University College, Washington University, St. Louis, Mo. He is a registered professional engineer in the State of Delaware, and also a member of the American Society for Metals and the American Society for Testing Materials.

Corrosion Engineering
a full measure

F. L. WHITNEY, JR.
President, National Association of Corrosion Engineers

"To obtain full measure of benefit, developments in combating corrosion must be made known, practically interpreted and applied . . . the corrosion engineer is the key."

Considerable progress has been made in the development of corrosion-resistant metals and alloys. In the plastics field extensive developments have been and continue to be made which makes the application of these materials for chemical processing a major consideration. The field of corrosion theory and the development of fundamental mechanisms has not been without attention. Our understanding of the causes of corrosion and the mechanisms of prevention is steadily increasing.

Much of this work has been fostered by the challenge of more severe chemical operations involving high temperatures and pressures in conjunction with strongly corrosive agents. That the challenge has been met and gives every indication of continuing to be met is heartening. Yet, full measures have not been realized from these developments.

This is evidenced by the necessity for corrective measures to reduce the terrific losses occasioned by corrosion. To obtain full measure of benefit these developments must be made known, practically interpreted and applied, and controlled. The implication is clear: the logical point at which to attack the problem is to stop corrosion before it starts.

The need for a formal and concerted effort in combating corrosion has been recognized and is actively and aggressively undertaken through the formation of the National Association of Corrosion Engineers. One of its major objectives is to develop forums and media through which experiences with corrosion and its prevention may be reported, discussed and published for the common good. Among other objectives are its liaison with industrial research, educational institutions and the promotion of training programs for corrosion engineering and engineers. Publications of this society and the many other technical societies interested in corrosion provide a wealth of data.

When these data are properly disseminated and applied they can go far toward the reduction of our large national economic losses caused by corrosion.

It seems natural that the corrosion engineer should be the key to assist plant operations in the proper selection and maintenance of materials of construction for the wide variety of process environments. It is not sufficient to develop this valuable information and let it remain idle in a desk or on a book shelf. It must be put into the hands of those responsible for the design, purchase, fabrication and construction and maintenance of process installations.

How then may this be accomplished? Again, it would seem that the responsibility lies with the corrosion engineer. It is his job to be versed not only with the corrosion-resistant characteristics of all materials but also with the effect of heat-treatment, stress, and physical and mechanical properties on corrosion resistance. In particular, he must know the limitations of materials, which if overlooked, may lead to unsuccessful or inadequate performance. For example: if an alloy steel is to be heat-treated to produce certain physical and mechanical properties required by the exposure, the corrosion engineer should review the conditions to be assured that the heat-treatment will not ad-

versely affect corrosion resistance in the particular environment.

Too often neglecting this aspect results in premature failure, or at best, high maintenance costs. A review with the corrosion engineer will afford the opportunity to select alternate heat treatments or materials of construction which will be compatible with the physical and mechanical requirements of the process as well as the corrosion requirements.

One of the ways in which both dissemination of practical data and corrosion control for the proper selection, procurement and fabrication may be obtained is through the development of engineering standards. They may be divided into three classifications: (1) procurement, (2) design and (3) fabrication.

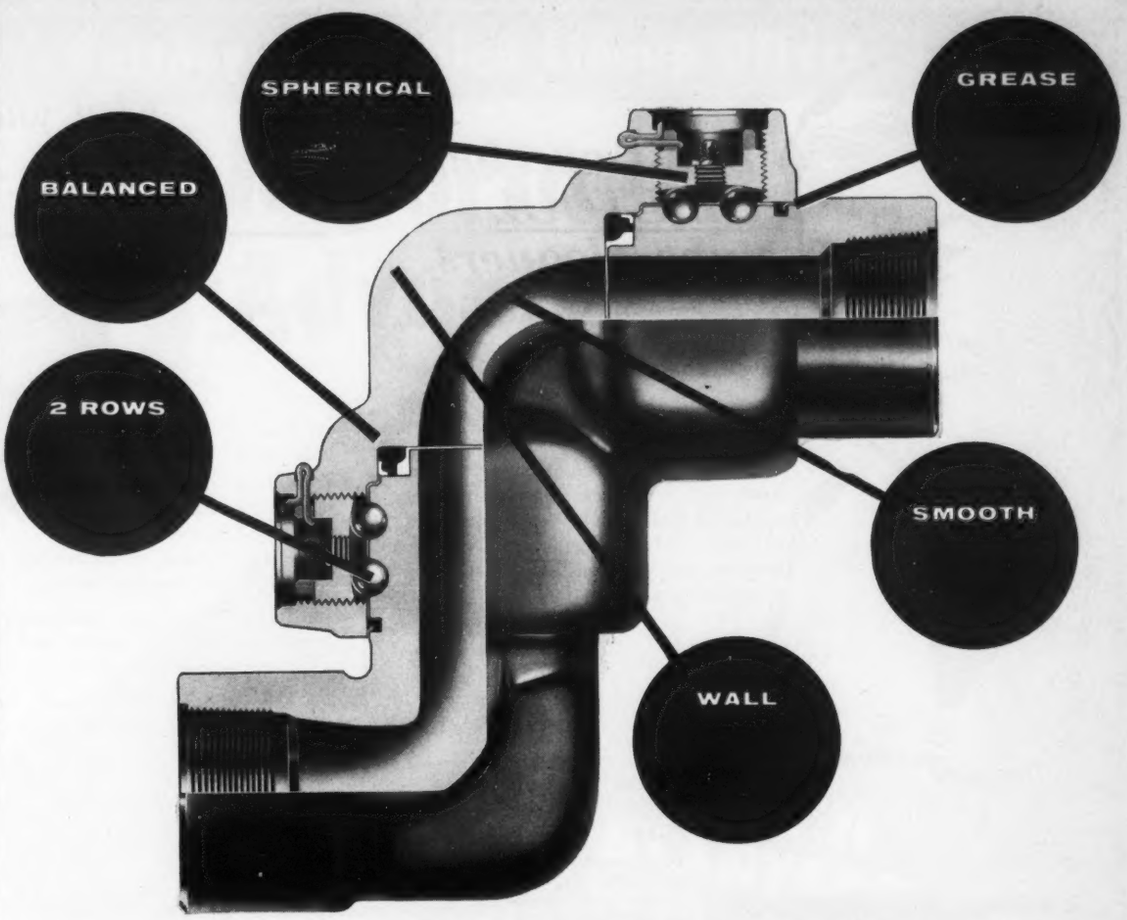
Procurement—It would seem logical that to be assured the proper material is obtained for either maintenance or fabrication purposes, procurement standards could be published throughout a company. These standards and specifications should include the chemical composition, heat-treatment, and finishing operations together with quality control tests and checks to insure that the material is received as specified. Utilization of such standards by engineering and purchasing personnel will, to a large extent, eliminate the use of inferior or out-of-specification material which might lead to early failure or uneconomical performance.

The importance of this step was recently demonstrated by the premature failures of certain austenitic stainless steel valves. After a few weeks of operation, the valves failed due to intergranular attack. Examination revealed that the chemical composition was not according to AISI specifications and that the castings had not been heat-treated to provide maximum corrosion resistance. Both of these factors contributed to the early failure.

Design—In a similar fashion, design standards may be established and disseminated to all pertinent personnel. These standards would incorporate good design practices which avoid fostering and accelerating corrosive conditions. Such features would include avoiding crevices and moisture traps; avoid lap welding — use butt welding; bevel nozzles and permit free drainage; avoid stitch or intermittent welding — weld continuously to avoid stress raisers and the susceptibility of stress-corrosion cracking; install bottom outlets flush with surface or recess to permit free drainage and thus avoid stagnant pools of corrosive material. There are many others.

Fabrication—The importance of fabricating and

(*Continued on page* 50)



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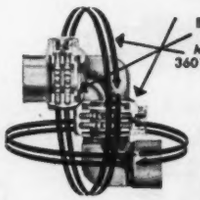
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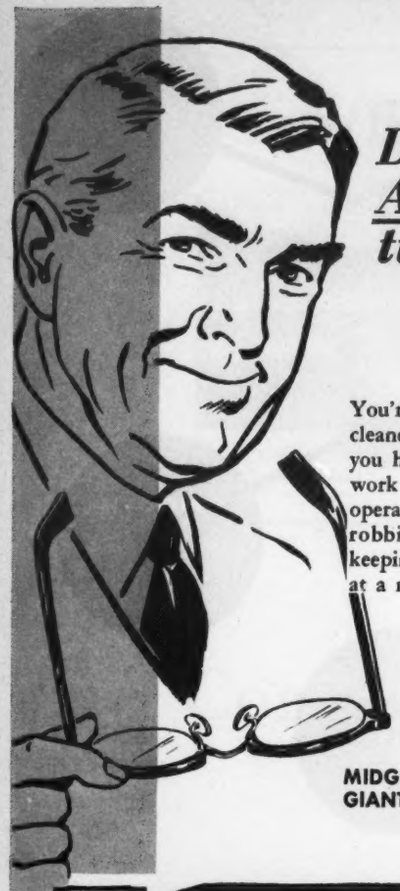


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what you can expect in next month's issue . . .

Pioneer in Epoxies



William C. Dabney, the man pictured here, is our key figure in the next of a series of "Pioneer of Progress" tributes to outstanding developments in the chemical industry.

Mr. Dabney, with a small research staff, developed the now popular and commercially-important epoxy resins.

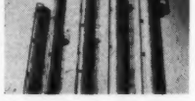
Associate Editor Bruce Fader, our "historian", visited Devoe & Raynolds in Louisville, actual producers of the epoxies and (while unsuccessful in stretching the trip to include the Kentucky Derby) came back with the full story of research, development, and some of the "chemical magic" going into these products.

Infrared analysis prevents catalyst poisoning

New plants are excellent sources of news, and American Cyanamid's much-talked-about Fortier, La., ammonia installation has provided the Instrumentation highlight for August.

News sources at Cyanamid furnished information about a little-publicized part of the ammonia process — how infrared analysis is used to prevent catalyst poisoning.

Aluminum jacketing — functional, attractive



Functional, attractive aluminum jacketing — on towers (such as shown above) and many other units — offer extensive (300,000 sq ft) protection at National Petro-Chemicals plant, Tuscola, Ill.

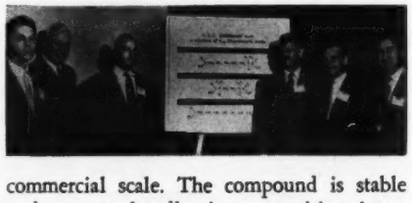
Assistant Editor Dick Callahan and the Chemical Processing Rolleiflex joined forces on a visit to Tuscola for a words-and-pictures account highlighting next month's Engineering and Maintenance section.

Materials headliners — fatty alcohols, Isosebacic acid

Some potentially-useful high-mw fatty alcohols which until now have never been available in very high purities, known chemical analyses, or in commercial quantities, are now being produced. Maker is Archer-Daniels-Midland, whose new plant for these compounds just opened in Ashtabula, Ohio.

These reactive chemicals, with their many desirable qualities, are described by Assistant Editor Frank McElroy, who obtained the story on a pre-inaugural visit to the plant.

US Industrial Chemicals' Isosebacic acid, developed through three years of research at the U. of Cincinnati, is now on a semi-



commercial scale. The compound is stable and easy to handle, is a promising intermediate for plasticizers, lubricants, polyamide and polyurethane resins.

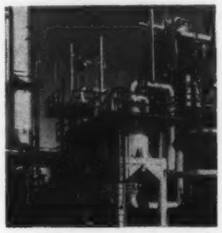
Men who have made significant contributions to the development (above) are, left to right: Dr. C. E. Frank, Director of Chemical Research, USI; Mr. E. Bierwirth, President, National Distillers; Dr. V. L. Hansley, Asst. Director of Research, National Distillers; Mr. F. Olmstead, Director of Development, USI; Mr. M. Faye, Market Development Dept., USI.

Quality black acids with 3-stage centrifugal system

A "New Solutions" feature next month is an installation account from the Opelousas Refining Co., Opelousas, La., telling how the

Here's a quick preview of features you'll find in the August Chemical Processing

company is making quality black acids from soapstock with a three-stage centrifugal system which eliminates need for Twitchell or pressure-splitting operations. Quality of the finished acids is such that distillers can obtain desired light-color acids with only one distillation.



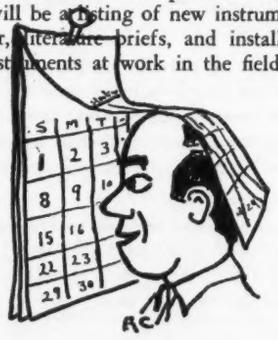
Covering Texas — Cosden Petroleum, Shamrock Oil

Associate Editor Gordon Weyermuller stomped his favorite hunting ground (Texas) recently, and found that big stories can come from small places. Chicagoan Weyermuller saw plenty of those wide open spaces en route to the Panhandle, where he got a vacationer's quota of sightseeing while visiting Cosden Petroleum at Big Spring and Shamrock Oil and Gas at Amarillo.

His calls paid off in stories appearing next month. The Cosden story, a New Solutions feature, tells how this petrochemical plant (see photo) produces reagent-grade aromatics in tank-car quantities with platinum catalyst and the Udex solvent recovery method. At Shamrock Oil, Gordon obtained details of that company's process for recovering sulfur from natural gas.

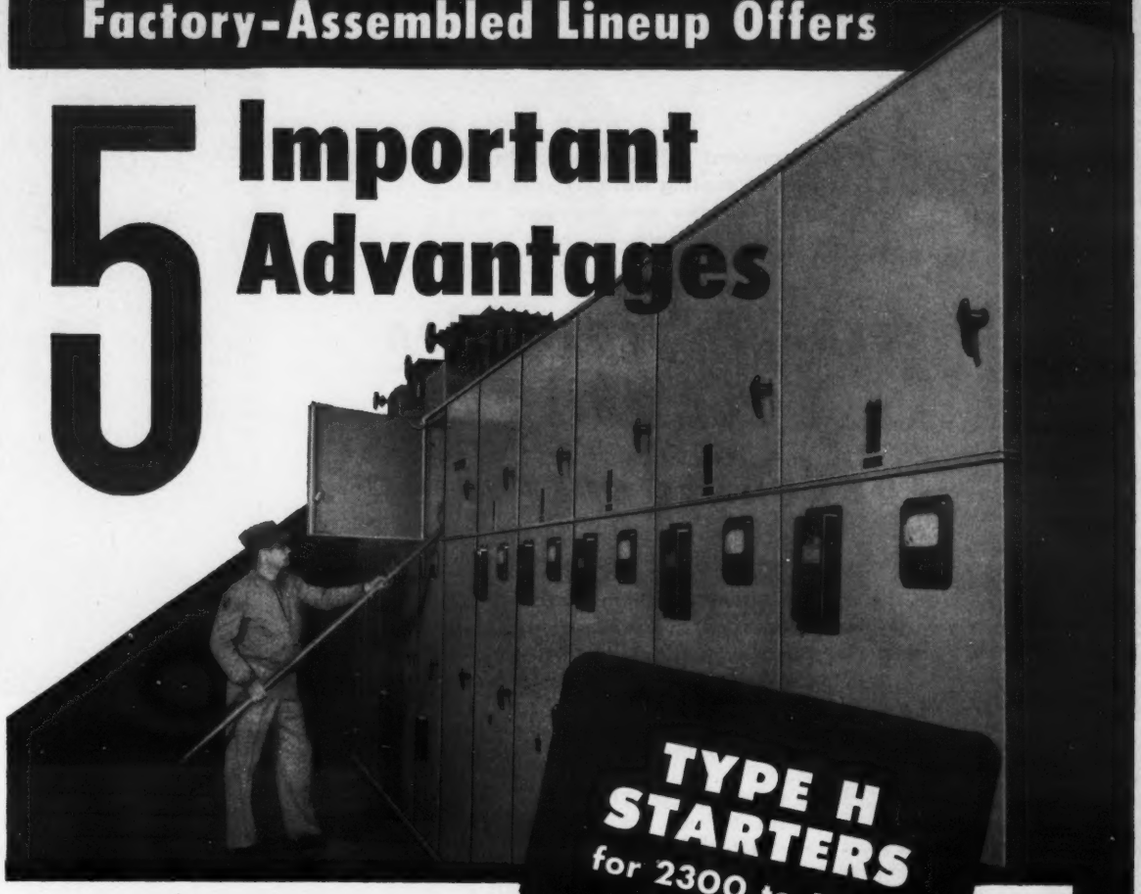
September song — instruments for every application

As with the Corrosion section in this issue, we'll be featuring instruments in September. Included in the section will be a listing of new instruments over the past year, literature briefs, and installation accounts of instruments at work in the field.



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2. Low-Cost Installation — Control group is factory-assembled *and bussed*. Conduit layout is greatly simplified. For example, lineup requires only one incoming power feeder.

3. Simplified Expansion — Internal bus and convenient wiring provision plus standardization of cubicle size facilitate addition of starters. Each starter unit is self-contained. Expanding the lineup is merely a matter of adding a starter and connecting the bus.

4. Attractive Appearance — Uniformity of cubicles presents a modern, streamlined appearance.

5. One-Company Responsibility Complete responsibility for assembling proper control devices and for control performance rests with Allis-Chalmers. A-4704

For complete information, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

When inquiring check CP 7849 opposite last page

At Standard Oil Company (Ohio) corrosive cooling water caused extensive repairs and frequent replacement of units — now . . .

cathodic protection controls condenser corrosion

Aluminum anode impressed-current system prevents formation of scale and rust, improves heat transfer at annual operating cost of less than 1% of equipment replacement cost



Fig 1—This is not a view of craters on the moon, but a closeup of corrosion on U-bend after only nine months service in condenser box without cathodic protection

CHARLES BALL,
Chief Inspection Engineer, No. 1 Refinery
The Standard Oil Company, Cleveland, Ohio
with **GORDON WEYERMULLER,**
Associate Editor

Problem: At Standard Oil Company, open box condensers handling gases and liquids coming from thermal cracking units were corroded badly (Fig 1) by the river water used for cooling. Previous life of a $15,000 unit was as short as four years. Framing within boxes had to be replaced every year. Repairs could not be easily made to coils due to their inaccessibility. Heavy scale which formed on metal surface lowered heat transfer efficiency.

Condenser boxes, about 15 of which are used at the refinery, average 55′ in length, 18′ in width, and 12′ in depth. Most of condensers are completely fabricated of carbon steel. Gases to be cooled pass through a 4″ diameter steel coil, known as a "worm", supported in the box by metal framework. Instead of the 4″ worm, some of the boxes use antimonial admiralty brass tubes, 24′ long and 1″ diameter in steel tube sheets, for cooling.

Each box uses water from nearby Cuyahoga River for cooling. Corrosive nature of water is shown by this typical analysis:

Phenol	30 ppm
Chlorides	23 ppm
Total solids	797 ppm
Dissolved oxygen	2 ppm
pH	6.6 ppm

Service is made more corrosively by the violent agitation of the water in some of the boxes to improve heat transfer (Fig. 2). Agitation increases oxygen content of water, making it more corrosive. Changing flow rates of water and petroleum products, varying temperatures, and complicated structure of interior combine with the other conditions to make this a terrifically tough exposure.

Refinery tried primitive cathodic protection in some of the boxes which helped alleviate the corrosion. However, current density was too low for adequate protection and an insufficient number of anodes was used to protect all parts of the complicated interior structure.



Fig 2—Turbulent agitation while boxes are in operation increases oxygen content of water, making it more corrosive

Solution: In June 1950 cathodic protection systems were installed in some of boxes which were designed to overcome the rather formidable obstacles presented by the corrosive cooling water



Fig 3—Close-up of sidewall of unprotected condenser box after several years service. Note heavy scale and corrosion. Even rivet heads (arrow) have been worn away at lap seam in center



Fig 4—Improved appearance of wall of this companion box, which has been cathodically protected for four years, is evident. Unit was in service for some period before it was protected

and the complicated structure. About 108 aluminum anodes, ¾" in diameter and 11' long, were suspended in a box in designated positions. A rectifier maintained current density of 8 milliamp/sq ft, 80 times that formerly used.

In a typical installation, cooling coils had an exterior surface area of about 5000 sq ft and the interior of box about 2500 sq ft, making about 7500 sq ft of metal surface to be protected. The eight milliamp/sq ft current density was selected to provide a minimum potential of −0.85 volts with respect to a copper sulfate half cell, used as a reference electrode. Rectifier unit had approximately 12 volts and 60 amp capacity. Aluminum anodes were installed vertically, being spaced two to three feet apart throughout the box. All electrodes were connected to positive terminal of rectifier, while negative connections were made to box and piping coils. Wiring was placed in conduit to prevent physical damage during maintenance.

Rectifiers operate from 110-volt 60-cycle single-phase input and are mounted in a transformer vault near condenser boxes. Electrodes are made of an aluminum alloy, 17S-T4, selected because it disintegrates more evenly than other aluminum alloys. The ¾" diameter electrodes originally used required replacement every one to two years. Now 1" electrodes are being used and are expected to last two to four years.

After initial installation proved successful, aluminum anode rectifier system was progressively installed in other boxes, nearly all of which are protected in this manner at preset. In April 1955

(*Continued on next page*)

For more stories on corrosion control, see section on p. 51



When inquiring check CP 7850 opposite last page

(*Continued from preceding page*)

the last of the six boxes for No. 2 battery thermal cracking coils was cathodically protected. This box, used for cooling light distillate, had been unprotected for several years. Fig 3 shows close-up of side wall of this box. Note the heavy scale and corrosion. Even the rivet heads have corroded away at lap seam in center.

Fig 4 shows side wall of companion box of same age, which has been cathodically protected for four years. Although box was in service for some time before it was protected, the improved appearance of the wall is evident. Fig 5 shows interior view of this same box.



Fig 5—Note clean appearance of wall and tubes in box which has been cathodically protected for four years. Number of aluminum anodes with oxide scale on them are visible

Each of condenser boxes shown in illustrations cools about 5000 bbl of distillate per day from approximately 370° to 100°F. Product inlet temperature in some of other boxes is as high as 700°F. About 100,000 gal of cooling water per hour is used in each box.

Voltage and amperage are checked every day at Standard Oil and adjustments made if necessary. Care is also taken to see that none of the anodes is pushed out of proper location in vessels.

Results: Present aluminum anode system not only prevents formation of scale and rust, but also removes that which was present before cathodic protection was installed. Maintenance has been cut down to practically nothing. Another advantage is that heat transfer has been considerably improved.

Installation cost of anode system for a condenser box is only a fraction of the cost of the equipment it protects. Annual maintenance and operating cost of system, including replacement cost of anodes, is less than 1% of the replacement cost of the equipment protected. In this application, operating equipment does not need to be removed from service during the installation of system.

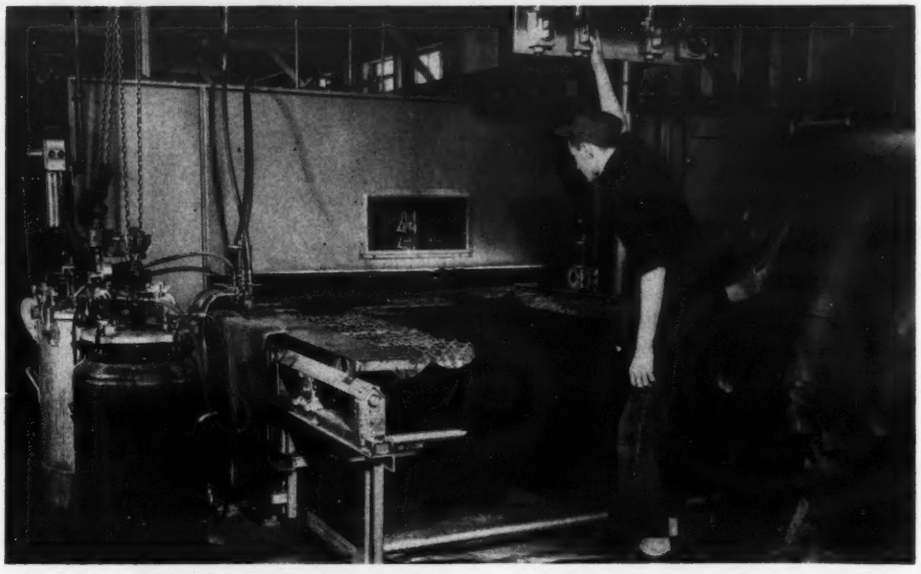
(Present cathodic protection system at Standard Oil was designed and installed by Harco Corporation, Dept. CP, 16991 Broadway, Cleveland, Ohio. Check CP 7851 opposite last page.)

new solutions
of processing problems

$50,000 fire loss led to installation of CO_2 system which provides . . .

flash fire protection in lacquer coating operation

Sides pass through a spray unit where horizontally-rotating four-headed sprayer coats them with butyl nitrocellulose. Then they go through a steam-heated, 170°F, oven dryer



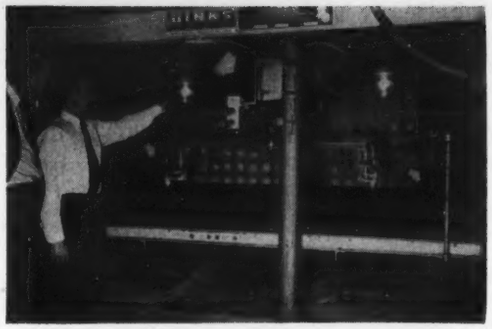
Hartland Tanning Co. safeguards against highly flammable butyl nitrocellulose

Coating operators at the Hartland Tanning Co., Hartland, Maine, have a healthy respect for butyl nitrocellulose. In the summer of 1954 a flash fire did $50,000 damage to property and knocked out the tannery's one spray unit and oven dryer. This equipment is used to coat "sides" with one-half second butyl nitrocellulose plasticized with castor oil to seal the "sides" and give them a high polish finish.

Here's what happened. An arcing electric motor ignited suspended particles of half-second butyl nitrocellulose in the spray unit, along with residues on the conveyor. With an almost instantaneous mushrooming effect, the fire spread down the entire 96-foot length of the sprayer-dryer. Spread of fire was so fast that even with the intense heat generated, the fire outdistanced opening water sprinkler heads above the assembly. All-told, seventy-six heads actuated.

Water spray kept fire down, permitting it to be extinguished within an hour, and limited fire damage to adjoining sections of the plant. However, water damage to work-in-process and machinery was most apparent just outside the immediate fire area and on lower floors where the water deluge accumulated.

Immediately plans were made to replace the destroyed unit with a new tandem, spray units and oven dryers. Simultaneously, engineers of Walter Kidde & Company, Inc. were contacted to design equipment that would immediately detect a fire in the new unit and cause it to be smothered by carbon dioxide before serious damage to machine could result or sprinkler heads open.



One of the two spray units which coats sides. Man at right points out a rate-of-temperature-rise fire detector (large arrow). If fire occurs, the rapidly increasing temperature causes the device to actuate nine 75-pound cylinders of carbon dioxide which feed nozzles (small arrows)

Recently installed $40,000 machine is 12-feet wide, 126 feet long, and an average of five feet high. It can procss 350 sides an hour.

Sides are hand-fed onto a wire mesh conveyor, pass through the spray unit where a rapidly horizontally-rotating, four-armed and four-headed sprayer coats them with butyl nitrocellulose. Then they are carried by the conveyor through the steam-heated, 170°F, oven dryer. At the end of this tunnel they are picked up by another conveyor and the spraying-drying operation is repeated.

New installation was designed to minimize possibility of fire. Independent conveyors limit the spread of flammable residue; power blowers whisk away explosive vapors continuously; all electrical equipment is explosion-proof, and other electrical-static safeguards are provided.

Should a blaze occur in spite of these precautions, a carbon dioxide fire extinguishing system stands ready to extinguish it automatically.

Sudden heat acting on rate-of-temperature-rise fire detectors mounted throughout the unit immediately trips nine 75-pound cylinders of the fire smothering gas. Pressurized gas escapes from its cylinders and is routed through piping to multijet nozzles in the spray units, in the exhaust air ducts, and others flanged into oven dryers.

Built into the piping network are pressure-operated switches and trips which are actuated by the passage of gas. They cause electrical power for the sprayer to be turned off, which stops the conveyor, spraying equipment, exhaust fans, and recirculating blowers — and they close all dampers.

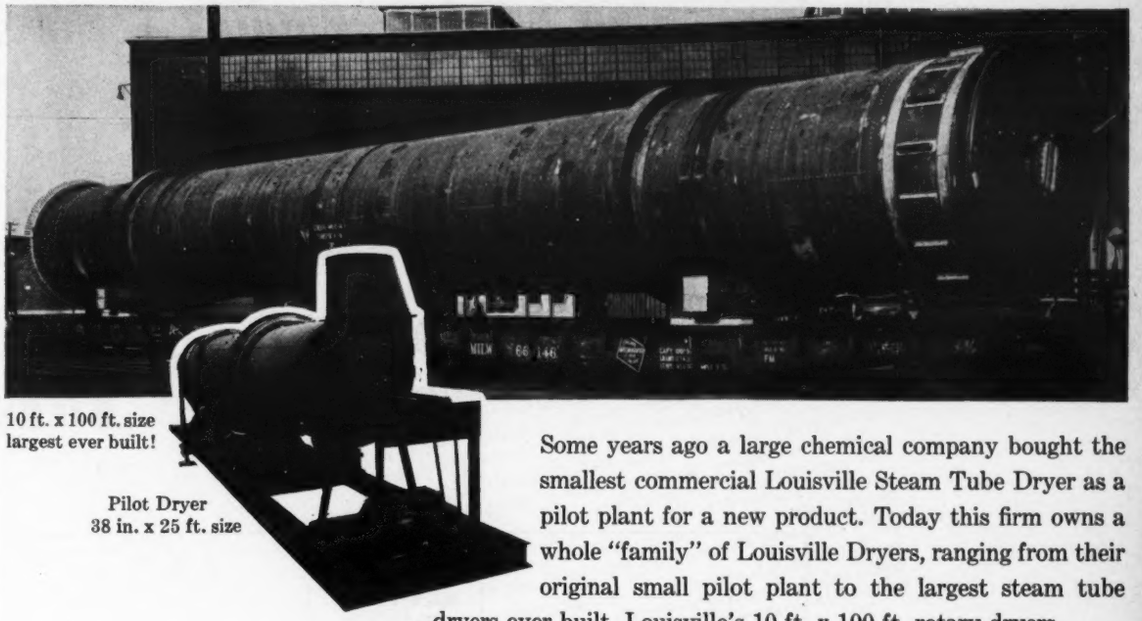
In addition to its fire extinguishing characteristics, carbon dioxide has another advantage. Being an inert gas, it cannot damage the sprayer-dryers, electrical equipment or work-in-process.

(System was designed by Walter Kidde & Co., Dept. CP, Main St., Belleville, N. J. Check CP 7852 on handy form opposite last page.)

Louisville Method

Louisville Dryer "Family" boosts production, cuts costs for chemical manufacturer

Dryer Types Installed
in one Plant Since 1933



10 ft. x 100 ft. size
largest ever built!

Pilot Dryer
38 in. x 25 ft. size

Some years ago a large chemical company bought the smallest commercial Louisville Steam Tube Dryer as a pilot plant for a new product. Today this firm owns a whole "family" of Louisville Dryers, ranging from their original small pilot plant to the largest steam tube dryers ever built, Louisville's 10 ft. x 100 ft. rotary dryers.

Large or small, there's a *right* size dryer for your job. Louisville relieves you of guesswork about dryer size, type or construction. Our engineers survey your problem . . . their recommendations are job-tested in our pilot plant. Your Louisville Dryer is *built*—not assembled—and built right for your job. Its performance is backed by over 50 years of successful drying experience.

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When inquiring check CP 7853 opposite last page

Here's how an up-to-date installation uses continuous centrifuges for

speeding wheat starch separations, improving product quality

Cuts processing time from eight hours to five minutes, ups yield 25%, uses one-third previous floor space . . . starch is suitable for "critical" food uses

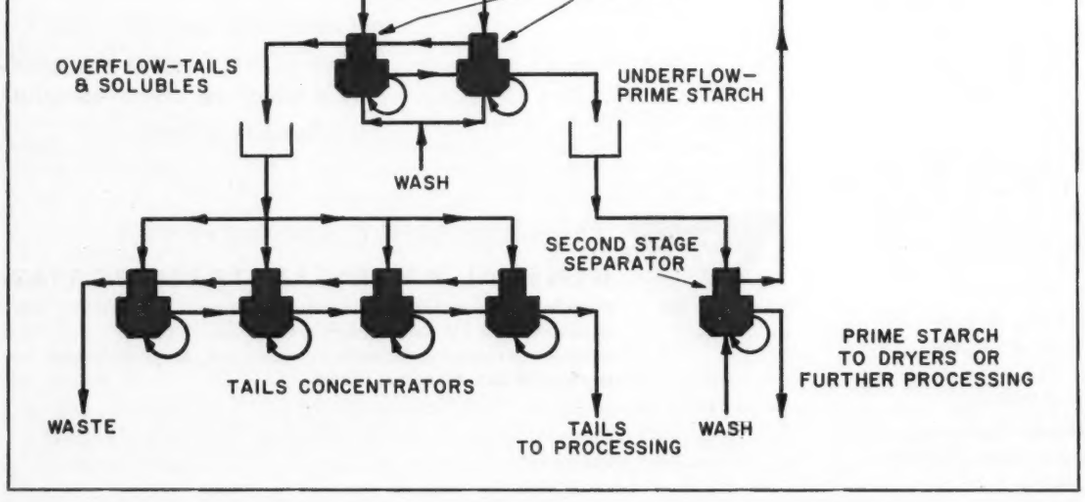
C. E. SCHMALZ, Superintendent of Process Development
The Huron Milling Company
with **TED F. MEINHOLD,** Assistant Editor

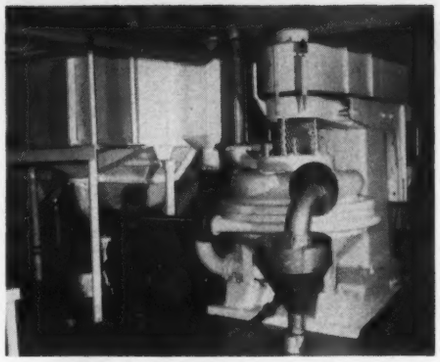
PROBLEM: Besides occupying an excessive amount of space, settling vats and tables used for separating wheat starch from "tailing" starch at the Huron Milling Company, Harbor Beach, Michigan, were slow and not too efficient. Although satisfactory separations were obtained in about eight hours, the nature of the solutions was such that *complete* separations could not be obtained by settling. Each of the 18 table sections was 110′ long by 12′ wide.

Company makes wheat starch by the Martin process. Flour and water are combined in a dough mixing machine to form a dough. Starch milk is obtained by washing the dough in a batch-type washer. Milk is separated into prime and "tailing" starch.

Solution: A two-stage continuous centrifuge process was installed in place of settling vats and tables. Starch milk is fed at 16,600 gph to two first-stage centrifuges. Units are fitted with carbide-inserted stainless-steel nozzles and operate at 2200 rpm. The centrifuges wash and separate prime starch from tailing starch, contaminants, and solubles.

Underflow (containing the prime starch) is gravity-fed to a stainless steel tank and then sent to second-stage separator. This centrifuge operates at 2050 rpm. Underflow contains washed prime starch. It is sent directly to dryers for production of high-grade edible starch, or to other modification processes to make high-grade laundry and specialty products. Overflow from centrifuge is recycled back to head of system





Operator checks viscosities on one of the first-stage separators

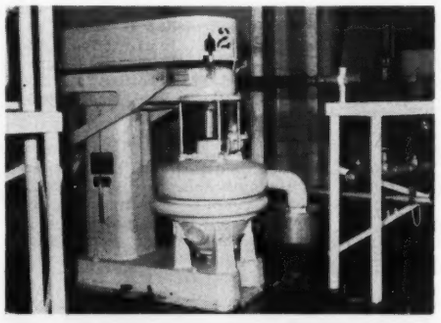
for further starch recovery.

Overflow from first-stage units (containing "tailing" starch, contaminants, and solubles) is pumped to four other centrifuges. Known as "tails concentrators", these units operate at 6000 rpm and separate the "tailing starch" from deleterious waste materials, thus providing starch for industrial adhesive products.

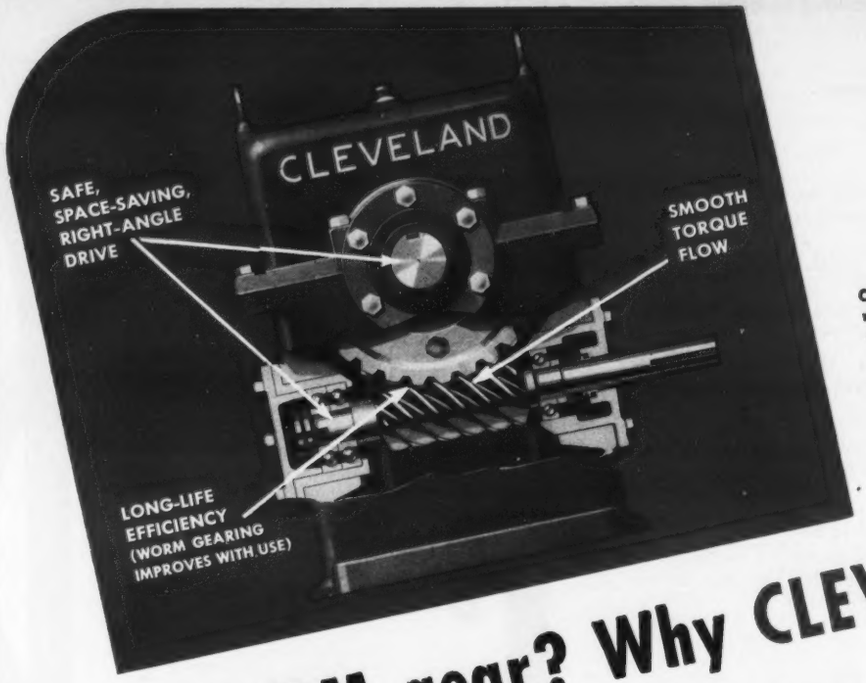
All centrifuges used in the system run continuously. They are simple to operate and easy to clean. Separator's "return-flow" principle, recycling some of the underflow, helps to stabilize interface between mixtures. Simple external valves can be set to assure maximum efficiency.

Results: New system separates prime starch from "tailing" starch in about five minutes — as compared to eight hours by previous method. Product quality has improved and prime starch yield is estimated to be at least 25 per cent higher. This has permited Huron to specialize in edible starches for cake mixes and similar products. Entire system occupies only 1/3 of the space formerly required by the settling vats and tables. Plant's appearance and sanitation has markedly improved.

(Centrifuges are product of Merco Centrifugal Co., Dept. CP, 150 Green Street, San Francisco, Calif. Check CP 7854 opposite last page.)



"Tails concentrator" operates at 6000 rpm; underflow contains purified "tails starch"



Cutaway shows compact interior design and construction of a typical Cleveland worm gear speed reducer, used in thousands of plants. Clevelands save floor space—are simple to install and maintain. A minimum number of moving parts practically eliminates trouble.

Why WORM gear? Why CLEVELAND?

HERE are some of the inside reasons why Cleveland worm gear speed reducers are specified by many of the leading builders and users of industrial machinery.

• **SAFE, SPACE-SAVING, RIGHT-ANGLE DRIVE**—Clevelands are compact, provide a wide range of reduction speeds. Worm and gear enclosed in sealed housing replace dangerous open gearing, belts and pulleys. Safety always for machine operators and lube men! Gearing runs in oil bath, insures positive lubrication, eliminates oil cans and grease paddles.

• **SMOOTH TORQUE FLOW**—By virtue of the sliding action of worm on gear, a Cleveland transmits power uniformly and smoothly. Constant angular velocity assures positive control of work on driven machine.

• **LONG-LIFE EFFICIENCY**—Experience demonstrates that Cleveland case-hardened worms and nickel-bronze gears actually improve with use. Even operating under continued, severe overloads, danger of sudden failure is remote. Thousands of Clevelands operate for the life of driven machines.

Get the complete Cleveland story by writing for new Catalog 400 today. The Cleveland Worm & Gear Company, 3257 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



When inquiring check CP 7855 opposite last page

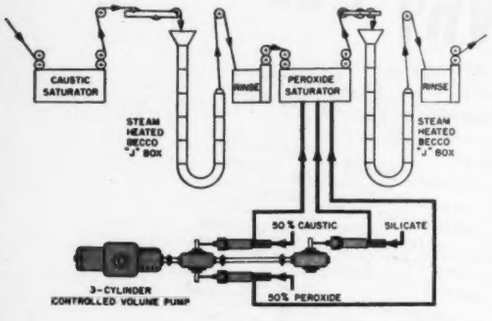
Speed cloth through bleach and get more uniform results . . .

continuous process turns out 50 to 250 yards per minute; batch process took 16 hours

Problem: At Lancaster, South Carolina, Springs Cotton Mills was spending 16 to 24 hours bleaching each batch of cotton. Cloth was first boiled in caustic solution for 8 to 15 hours, then rinsed thoroughly. After rinsing, cloth spent 4 to 8 hours bleaching in alkaline peroxide solution.

Besides slowness of this operation, labor cost was high, lots of steam was used, and uniformity was not so good from batch to batch — or even within one batch.

Solution: Switch was made to a continuous and automatic operation. Two saturating baths (one for caustic and one for peroxide) are used. Becco



J-boxes and rinsing baths are incorporated at the proper places in bleach range. Peroxide saturating bath is maintained in proper solution concentration by three cylinder gang pump.

Motor-driven controlled volume pump uses 3-cylinder gang arrangement given through ½ hp speedchanger. Each cylinder is equipped with hand dial adjustment for individual setting of stroke capacity while in operation.

Cylinder No. 1 pumps hydrogen peroxide solution. Construction is 316 stainless steel. Fifty-eight strokes per minute deliver 10.5 gph against discharge pressure of 5 psi.

Cylinder No. 2 pumps sodium silicate (used to provide stability and proper alkalinity of the bleach). Liquid end is cast iron and discharge specifications are the same as first pump. Flush stream connections on lantern ring permit flushing crystals which would tend to form on packing and plunger.

Cylinder No. 3 pumps 50% caustic. Liquid end is of 18-8 stainless steel. Forty-eight stroke per minute drive delivers 4 gph against 5 psi discharge pressure.

Driving power for ganged cylinders is ½-hp, 3-



IT PAYS TO LOOK AT THE ADVANTAGES OF USING B&W SEAMLESS WELDING FITTINGS

Welded Construction Assures Minimum Pressure Loss — True circularity and radii, uniform wall thickness, and smooth inner walls reduce friction, turbulence and subsequent erosion, adding to piping system life.

Welded Construction is Easily Insulated—Insulation is simplified by the absence of complex flanged assemblies. Because joints are leakproof, insulation is permanent and maintenance free.

Welded Construction is Simple to Install—Dimensional accuracy of angles, radii, and bevels, assure quick and easy joining. Any qualified welder can do the job efficiently and economically.

Whole Sections Can Be Shop-Fabricated — For fast installation, or where working space is limited, entire sections can be shop-fabricated and installed by any qualified welder in a few minutes.

Welded Construction is Permanent — Maintenance costs are kept at a minimum because piping is permanent and leakproof. The strength of the weld approaches that of the pipe itself.

Welded Construction is Lightweight — Strength combined with lightweight permits easy handling in installation. Unwieldy sections can be joined on the ground, and then fastened into position.

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phase, 60-cycle, 550-volt motor with speedchanger allowing adjustment from 1450 to 180 rpm. This speedchanger drives gear reducers and through these the pump pistons. Combined pumping rate can be changed by means of speedchangers to accommodate various materials being bleached.

Results: At first, some shaft scoring was found with the sodium silicate pump. Flushing arrangement cured this. Cotton mill has found that a minimum of operator attention is required, bleach costs have been reduced and uniformity of bleaching is excellent.

Installation was so successful that a second unit, a third, and then a fourth were ordered. Bleaching is now carried on at a rate of 50 to 250 yards per minute of cloth depending on material handled.

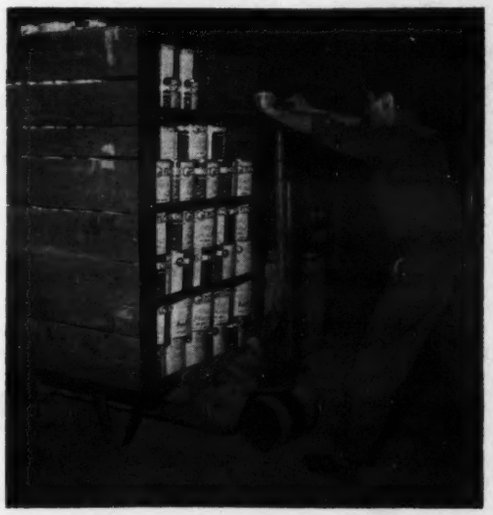
(Controlled volume pumps were furnished by Milton Roy Co., Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. . . . or for more information check CP 7857 on handy form opposite last page.)

Mobile bins simplify handling, storage in paint plant . . .

easy to move, each holds 400 one-gallon cans

Mobile bins, for moving and storing cans of paint, were one of the many ideas incorporated by Lehman Bros. Corporation, when they enlarged and modernized their Jersey City, N. J., paint and varnish plant. Easily moved with conventional lift trucks, the bins hold approximately 400 one-gallon cans apiece, and cut handling of product to a minimum.

(*Continued on next page*)



Mobile bins are easily moved with lift truck



When inquiring check CP 7856 opposite last page

USE STRAINERS?
USE YARWAYS



■ Use pipeline strainers in your plant? If so, you've plenty of reasons for using YARWAY Fine Screen Strainers.

Some of the reasons are these:

- Available in *iron* or *steel* with rust-resistant finish, also *bronze, stainless steel* and *aluminum.*
- Dutch weave Monel woven wire screens have high mechanical strength, extra fine straining service. Also perforated bronze, monel or stainless steel.
- Easy to remove screen caps with straight threads to assure proper alignment of screen.
- 10 standard sizes from ¼" to 3". Larger sizes to order. Also flanged and socket-weld connections.
- Stocked and sold by over 300 industrial distributors in the United States, Canada and abroad.

Write today for YARWAY Strainer Bulletin S-204, and name of nearest distributor.

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SCREEN EASILY REMOVED
Unscrew cap and screen comes out with it. When replacing, put screen in cap, then screw cap into body. Straight threads assure correct alignment, no screen distortion. Cap is tapped for pipe plug or blow-off line.

YARWAY FINE SCREEN STRAINERS

When inquiring check CP 7858 opposite last page

(*Continued from preceding page*)

Paints are produced in one end of the building, put into cans, and stored at the other end. Cans are placed into the mobile bins immediately after they are filled. Floor in storage area is clearly marked for proper placement of bins, resulting in wide aisles and a neat overall appearance.

In constructing these bins, ordinary 42 x 54 inch metal-base wooden pallets were used. Walls and cross-supports are built of 2 x 60 x ⅛ inch thick



Properly placed, bins provide wide aisles, neat-looking storage area

angle iron. Some bins have walls completely enclosed with lumber, while others have only the metal framework for the walls. Using bins for both moving and storing has also cut down need for other hand trucks.

(Mobile bins were designed by Lehman Bros. Corporation, Dept. CP, 22 Halladay Street, Jersey City, N. J.)

Underground injection well solves waste disposal problem . . .

300-ft thick strata found 1400 ft below plant

Problem: Waste effluent emanating from operations at Parke, Davis and Company's chloromycetin plant, Holland, Michigan, was such that it could not be disposed of by conventional means. General nature of the material was as follows: intense reddish-brown color, 3.7 pH, 60,000 ppm dissolved solids, 2 to 5% toxicity, and a 20 day BOD count of 45,000 ppm. Officials investigated practically every known method of waste disposal and rejected them all — either installation and operation costs were too high, or system would not do a good enough job.

Solution: Due to the presence of oil wells in the area, engineers gave thought to the possibilities of using an underground injection well. With aid of State Geologists, they found a very promising strata for waste disposal existed just about 1400 feet below their plant. The traverse limestone formation was approximately 300-feet thick and saturated with lime.

After taking samples to make sure that the wastes did not have any serious reactions with the limestone or the brine, a seven-inch diameter casing was drilled down to the top of the strata, and another 200 feet of open hole drilled into the limestone. Standard, heavy-walled two-inch diameter oil-well-type upset tubing was installed within the casing to carry the waste. To protect casing from attack by wastes coming up through annulus between the tubing and casing, annulus was sealed off at the bottom.

To equalize pressure exerted on bottom seal by brine, annulus was filled with water. As a leak detection measure, water was kept at higher pressure than that used for pumping the wastes. Any drop in the water level would therefore indicate a leak in the system.

Results: All deleterious wastes emanating from the plant are now sent to wooden storage tanks, filtered, and pumped to the underground well. Pumping pressure over past two years increased from 110 to 150 psi. By permitting well to backflow for short period of time, pumping pressure was again reduced to 100 psi. As safety measure, a potable grade of water was pumped during first few weeks of operation. This helped check system for "bugs" and also pushed brine solution away from discharge end of well — reducing chances of inter-reaction and precipitation between waste discharges and brine.

An important maintenance problem which had to be solved was how to work on the well's connecting piping (pressure side) without having the waste back up. This was solved by pumping approximately 300 gallons of calcium chloride into the well. Solution is heavy enough (sp gr 1.32) to hold waste level down to 100 feet below grade, permitting leaks to be repaired. If and when it becomes necessary to replace tubing in well, same procedure will be followed, except that about 3000 gallons of a brine solution will be used.

(Summary of paper presented at Ninth Industrial Waste Conference by J. Adinoff*, Parke, Davis and Company, Dept. CP, Joseph Campau Avenue at the River, Detroit 32, Michigan.)

*Presently Chief Engineer, American Potash and Chemical Corporation, Eston Chemicals Division, Los Angeles, California.

Processing and Engineering Data starts on page 74

Here Is Extra Motor Value



Double-shielded bearing
Large grease reservoirs
Bolted-on bearing cap
Labyrinth seals

This Allis-Chalmers Bearing Design Gives More for Your Motor Dollar

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

You can lubricate these bearings without dismantling motor. Pipe-tapped holes in the bearing housings at two points provide means for inserting new grease, flushing out old grease and of relieving pressure during re-greasing.

Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225.

A-4616

ALLIS-CHALMERS

When inquiring check CP 7859 opposite last page

WHERE TO START A GOOD NEIGHBOR POLICY



The area above, enclosed by the dotted lines, is an important area of good "neighbor relations". Today, more than ever before, plant management is turning its attention to industrial air cleaning — and replacing noxious or nuisance chimney discharges with harmless plumes. Here, indeed, is the good-neighbor policy in action.

"Buffalo", pioneer in this field, has developed a broad line of equipment to meet the most rigid requirements of industry. "Buffalo" units are handling almost every conceivable contaminant, from low concentration toxic gases to stringy or abrasive discharges. They are handling them with high collection efficiency and minimum maintenance.

"BUFFALO" EQUIPMENT IS AVAILABLE TO SOLVE MANY DIFFICULT AIR CLEANING PROBLEMS

- Gas Absorbers
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When inquiring check CP 7860 opposite last page

Difficult filtration of Aureomycin made economically practical by precoat unit . . .

cake and some precoat is shaved off turning drum, keeping filtering surface clean

Problem: In producing Aureomycin chlortetracycline the separation of Streptomyces aureofaciens mycelia from their broth, by filtration, is difficult—so found the Lederle Laboratories Division, American Cyanamid Co. at its Pearl River, N. Y. plant. Mycelia are slimy and tend to form thin, sticky, almost impermeable filter cakes. These cakes shorten the filter cycle to impractical limits and plug or blind the filter medium almost instantly.

Batch-type pressure filtration is possible by using excessive amounts of diatomaceous earth or other



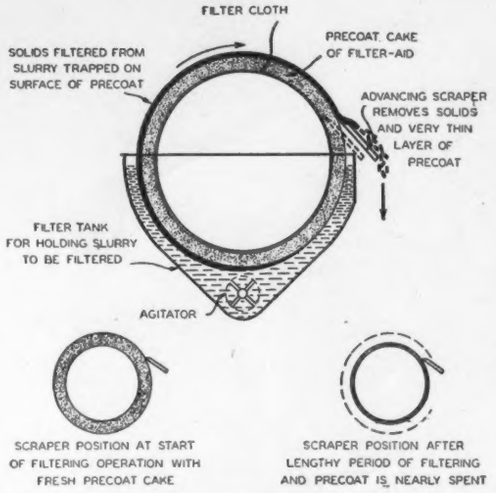
S. aureofaciens mycelia being scraped off precoated drum filter

filter aids. However, operating costs, and their natural reflection in the end product price, become prohibitive with this process.

Solution: About three years ago, Lederle placed four precoat vacuum drum filters in operation in the mycelia separation step of its Aureomycin process. After drum surface is precoated with a 2 to 3" layer of diatomaceous earth, mycelia and broth are pumped into filter tank. Slimy mycelia are deposited on surface of precoat. Broth passes through filter aid and is drawn off continuously at filter valve for waste disposal.

Meanwhile, drum continues rotation out of slurry level of tank. After cake accumulated on surface is sucked dry, a sharp scraper shears off the mycelia cake and a few thousandths of an inch of the precoat. This exposes a fresh layer of precoat as the drum rotates into slurry again for repetition of cycle. Cake is further refined and filtered to produce the antibiotic.

After precoat is consumed by slowly-advancing scraper, filter stops automatically and fresh precoat is applied. In the Aureomycin process, precoating is necessary twice daily.



Principle of precoat filter. Depending on material being filtered, scraper blade may be adjusted to shave off from .0003 to .005" of precoat with each revolution of drum

The slurry, filtered at room temperatures, is comprised of 2 to 3% suspended solids. Filter (375 sq ft of surface) can handle several thousand gallons of the mycelia broth slurry per hour.

Results: Precoat drum filters have made this operation economically practical since, in proportion to the amount of mycelia removed, the volume of filter aid required is small. Efficient and continuous operation of the filter principle effects even greater economies by aiding in the prevention of spoilage or deterioration of the delicate product.

Although the filters are run continuously at Lederle, very little maintenance has been required. They are cleaned with steam jets about once a week.

(Precoat filters are products of Dorr-Oliver Inc., Dept. CP, Barry Place, Stamford, Conn. . . . or for more information check CP 7861 on handy form opposite last page.)

How to solve piping problems told in bulletin

How to solve piping flexibility problems is explained in eight-page illustrated bulletin. Detailed information on simplified switching of permanent piping lines is included, plus a section on how to protect lines against shock, tank settling, and thermal movement. Swing joints and flexible ball joints as used in tank truck loading and unloading lines are discussed.

Bul 28 is issued by Barco Manufacturing Company, Dept. CP, 501 Hough Street, Barrington, Illinois. Specify CP 7862 opposite last page.

ABRASIVES . . . . ASPH . . . ARTIFICAL STONES . . . MPOUNDS

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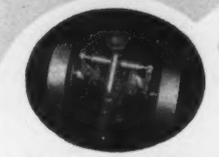
NT . . . . SOAP PRODUCTS . . . . . CONE CARBIDE

. . . . TERRA COTTA . . . . WH . . . . . WHITEWARE

ZI . . . . . WATER SOFTENERS . . . . . S . . . . ZIRCONIA


No. 2F MIX-MULLER
6'8" pan dia.
30 cu. ft. capacity


No. 3F MIX-MULLER
8'4" pan dia.
60 cu. ft. capacity

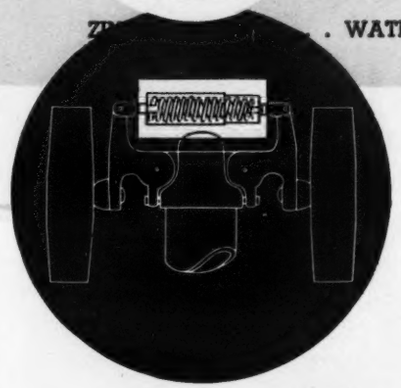

No. 1½F MIX-MULLER
5'4" pan dia.
15 cu. ft. capacity


No. 1F MIX-MULLER
4'2" pan dia.
7½ cu. ft. capacity


PORTO-MULLER
3'3" pan dia.
2½-3 cu. ft. capacity
(100% Portable)


LF laboratory MIX-MULLER
24" pan dia.
¼-½ cu. ft. capacity

SIMPSON
MIX-MULLERS



Six New Models and a *NEW DIMENSION* . . . for your Profit Picture

● Does your mixing equipment carry a fair share of the responsibility for adequate profit over materials, manpower and maintenance?

Shown above are six new Models of the Simpson Mix-Muller. Each unit in this new "F" series has been thoroughly plant tested to offer the most for your investment dollar. Providing a *new dimension* in mulling efficiency, the "F" Series Mix-Mullers have spring-loaded Mullers . . . are literally *loaded for action* to provide infinitely variable control over mulling pressures. Positive, V-belt drive, centralized lubrication and simplified, yet traditionally rugged design help to cut maintenance to a minimum . . . assure ease of operation, insure more, better mulling for every dollar invested.

Available in 13 models, in batch capacities of 1/10 to 60 cu. ft., Simpson Mix-Mullers may be equipped to meet every processing need . . . as a reaction vessel . . . for heating or cooling while mixing . . . in stainless or other special metals.

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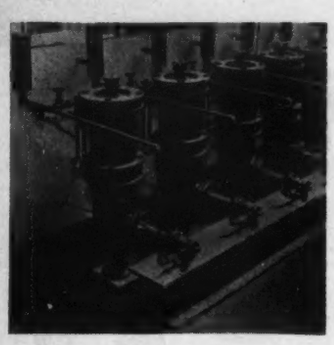


When inquiring check CP 7863 opposite last page

DuPont stops corrosion of steam jet diffusers with titanium . . .

resists high velocity steam and dilute HCl

Problem: Cast iron steam jet diffusers had to be replaced every three months at a plant of the Pigments Dept. of E. I. duPont de Nemours & Co., Inc. Steam jet assemblies are used to create process vacuum. The diffusers were corroded by high velocity steam and dilute hydrochloric acid.



Titanium steam jet diffusers at DuPont have lasted 17 times as long as those formerly in use. New models, based on experience with first models, are pictured

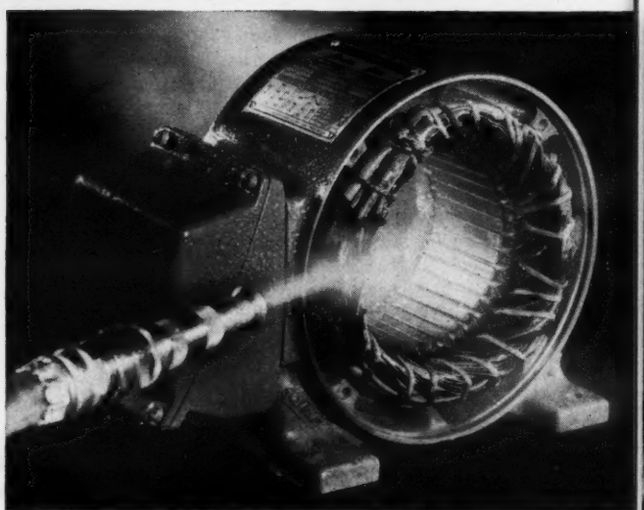
Solution: DuPont engineers tried a variety of corrosion-resisting metals, including special purpose alloys. None of these provided any real improvement. Then titanium was tested and later specified for the diffusers.

Results: Original titanium steam jet diffusers, placed in use about 2½ years ago, are still operating to date, having furnished continuous trouble-free service with no sign of corrosion. To date, these titanium diffusers have shown 17 times the average life of former diffusers.

(For more information on A-70 bar stock used in steam jet diffusers contact Rem-Cru Titanium Inc., Dept. CP, Midland, Pa. Check CP 7864 opposite last page.)

(Titanium steam jet diffusers were fabricated by Schutte & Koerting Co., Dept. CP, Cornwells Heights, Pa. Check CP 7864A opp. last p.)

MOTOR FACTS ON INDUSTRY'S
MOST PREFERRED "POWER PACKAGE."



Electrical System Fact—New exclusive Bondite impregnating varnish, partner to new Bondar and Mylar* insulations, guarantees complete resistance to weather. It doesn't just repel, it resists—all the way through.

*Du Pont Registered Trade-Mark

FACT:

The new Life-Line A is the most weather-resistant motor on the market

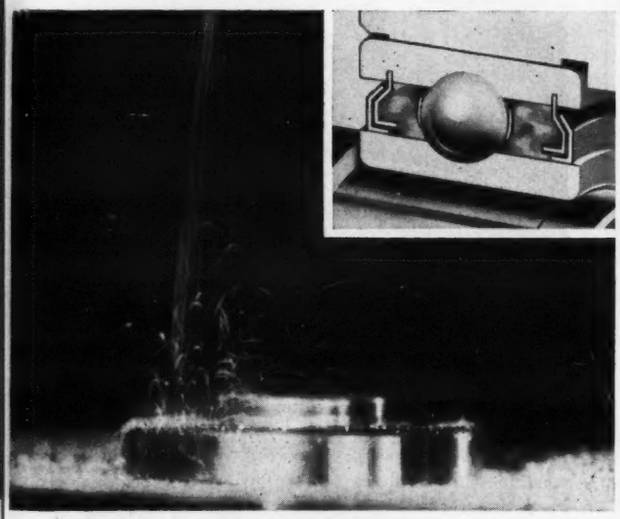
Whether your application is hot—cold—wet or dry, you'll find the new Westinghouse Life-Line® "A" motor will last longer under more extreme weather conditions than any other motor you can buy.

New insulation materials, housing designs, 4-way sealed bearings are tangible evidence of electrical, mechanical and lubrication system improvements that make Life-Line "A" industry's most preferred package of power.

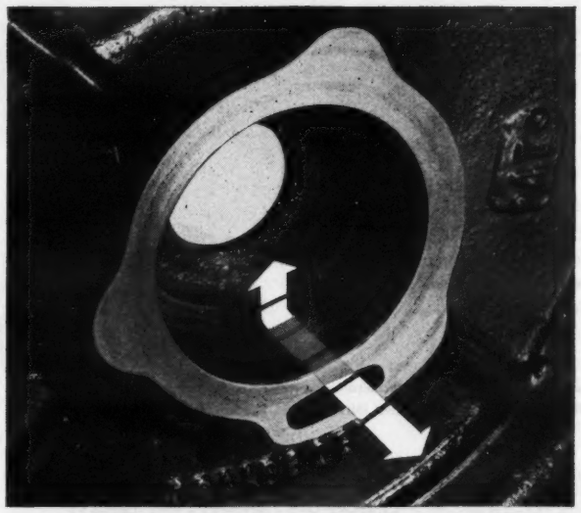
Get all the facts by calling your Westinghouse sales engineer . . .
The Man With The Facts.

J-21882

YOU CAN BE SURE...IF IT'S Westinghouse



Lubrication System Fact—Two outer seals of new 4-way sealed bearing act as flingers and literally (see photo above) throw off damaging contaminations. Inner seals, attached to outer bearing race, are stationary and form a positive labyrinth with outer seals.



Mechanical System Fact—New exclusive air by-pass on totally-enclosed motor permits the motor to breathe around the bearing—not through it—minimizing atmospheric damage. Finest grained castings used in new cast-iron housings.

Cascade coolers double as heat exchangers, cooling tower

Evaporative cascade coolers double as water-cooling tower as well as heat transfer apparatus at Eagle-Pitcher's Galena, Kansas, sulfuric acid plant. Not only does the system save water in an area where water is scarce, but it also provides adequate cooling in a small space.

Units combine water-cooling principles of a conventional wood tower with heat exchanger principles of cast-iron cooling sections through which acid flows. Both functions are combined in one space with one catch basin, one set of water pumps.

Separate units were designed for cooling the 98% acid from absorber tower and the 93% acid from drying tower. In each case, acid is circulated at 1000 gpm. Instead of directing a specific flow of water over cooling sections, entire cooling area is blanketed with a spray from a series of Binks Rotojet nozzles. A "checkerboard" of water over coolers and pit is formed.

About 40% of the water ultimately contacts sections. Water circulation quantity is about 2½ times what it would be in a conventional installation.

Excess water, falling through a considerable height after being finely divided by the nozzles, exerts a proportional cooling effect on the heated water from heat transfer surface, which is collected with it. Evaporative effect from warm water on surface of sections also adds to cooling effort.

(Cascade coolers are product of The Heat Transfer Division, National-US Radiator Corporation, Dept. CP, 221 Central Avenue, Johnstown, Pa. . . . or check CP 7865 opposite last page.)

For more information on product at left, specify CP 7866 . . . see information request blank opposite last page.

Case No. 58
Results Bring Re-Order from Heyden Chemical Corp. for Second Kemp Inert Gas Generator

Heyden Chemical doubles its blanketing savings with Second Kemp Generator

HERE'S A CASE where simple mathematics paid big dividends at this Garfield, New Jersey plant. When Heyden Chemical—one of the nation's leading producers of formaldehyde, pentaerythritol, salicylic acid, etc.—installed its first Kemp Inert Gas Generator to furnish CO_2 for blanketing a special grinding operation, it was on more or less a test basis. Part of Heyden's constant search for newer, better, cheaper ways to improve its products. The rest of its blanketing needs were still being handled with CO_2 from large storage tanks in the plant.

Immediate Savings with Kemp

Results with the first Kemp Inert Producer were impressive. Now a second (see right) Kemp unit has been installed and actual savings over previous costs are estimated at over $500 a month for the first year. In addition to dollars saved, Kemp Generators assure a safe, dependable supply of chemically clean inerts. Deliver inerts at a special analysis . . . without fluctuations.

Kemp Designs Versatile

If you still rely on old-fashioned inert sources or are dissatisfied with present inert equipment, let Kemp help you, too. Kemp Engineers will be most happy to help solve your inert problems . . . show you how you can get similar results with fast-starting, easy-to-operate Kemp Generators. It costs you nothing to investigate. And it may save you real money.

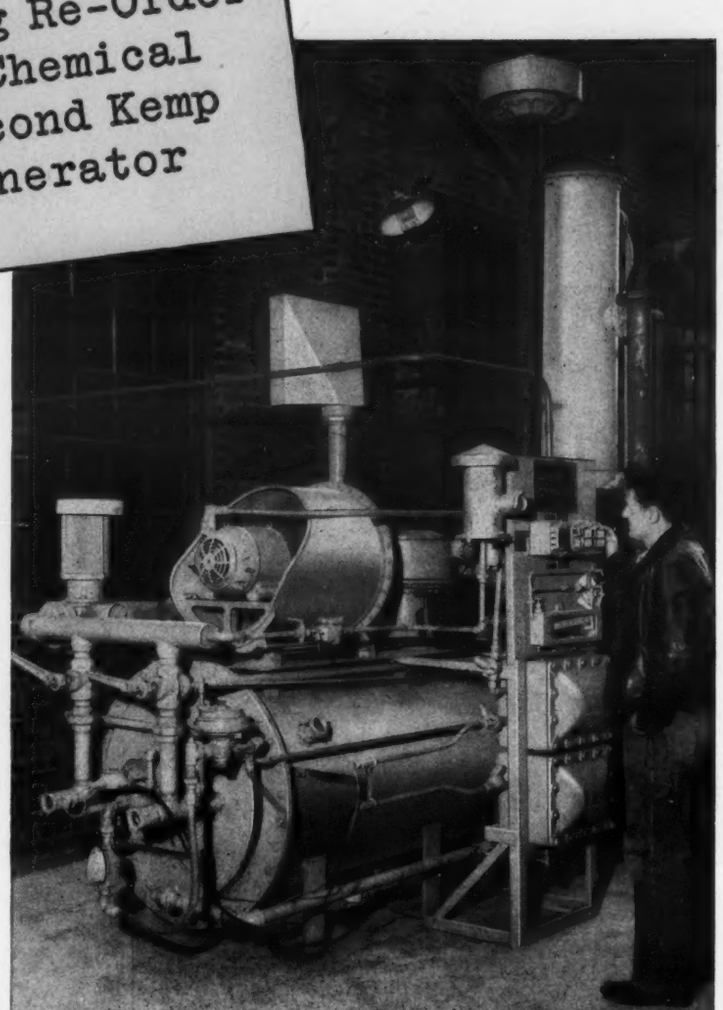
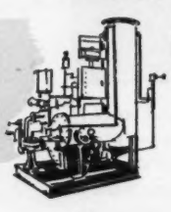


Photo at right shows close-up view of Kemp Industrial Carburetor. Part of every Kemp installation, it eliminates tinkering, waste. Assures complete combustion at all times. Reduces installation costs and maintenance.



For more complete facts and technical information, write for Bulletin I-10 to:
C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Maryland.

KEMP OF BALTIMORE



INERT GAS GENERATORS
CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE
DRYERS • SINGEING EQUIPMENT

When inquiring check CP 7867 opposite last page

Laboratory procedures for pulp bleaching

Test procedures for preliminary evaluation of various peroxide pulp bleaching treatments are detailed in 16-page book. Low, moderate, and high-density bleaching procedures are outlined, as are pretreatments, sheet-making, and chemical tests relating to hydrogen peroxide and other bleaching chemicals on the pulp.

Bul 66 is issued by Becco Chemical Division, Food Machinery and Chemical Corp., Station B, Buffalo 7, N. Y. . . . or for more information check CP 7868 opposite last page.

Automation takes over counting — and spots troubles before inner tube molders can . . .

now observer at switchboard tells mold supervisor when things go wrong

Problem: Inner tube manufacture at Goodyear Tire & Rubber in Akron is typical of many repetitive processes in use in chemical plants. Donut molds there turn out 18,000 tubes a day. Accounting for each tube manually as it goes through this process would be impractical. Yet a miscount of as little as two tubes per mold per day could total 100,000 to 150,000 tubes a year.



These are Donut molds whose operation is recorded

Solution: In order to keep tabs on tube molding, Goodyear set up a battery of eleven 20-pen Operation Recorders. Signal originates with a pressure actuated switch connected to high pressure air line which inflates tube after mold is closed. Number of tubes cured and time of curing for each is indicated on record.

Proper cure depends of temperature-time cycle. Molds are steam heated. Air-operated switch operates from time mold is fully closed and air is admitted until mold is reopened.

NEWS from FILTERTOWN

A recent survey establishes that clarity of filtration is the most important factor in the selection of a filter medium. Since E&D filter papers give the "finest" filtration, more E&D filter papers are used by industry than the total of all other filter papers combined . . . To cite but a few applications: grades 609 (WINE-BRITE) and 902 (*BREW-BRITE®) are widely used in filtration of alcoholic beverages; 623 is extensively used for filtration of chemicals; 615 and 617 for foods and beverages; 613 for drugs and toilet preparations; and there are many more . . . This is not to say that any grade is universally used in any specific industry. Too many varying factors make this impossible. That is why E&D 's know-how, based on the practical experience of many decades, enables us to help you select the right grade for your particular assignment . . . Moreover, this is the only company in America exclusively engaged in the manufacture of filter paper for science and industry. There are many regular grades and special grades available. You can rely on any E&D filter paper to perform as recommended. Why take a chance on unidentified papers? The cost in loss of time and money can be serious . . . Write for free samples. Test them. Discover why E&D filter papers are used exclusively by most of America's leading industries . . . If you have a bothersome filtration problem write for our free Filtration Analysis Report. Chances are we know the answer . . . Used alone, or with cloth, there's an E&D filter paper to give you clarity of filtration and savings in time, labor and money.

E&D® The EATON-DIKEMAN Co. FILTERTOWN MT. HOLLY SPRINGS, PENNA.

When inquiring check CP 7869 opposite last page

Using plugs and jacks in a switchboard setup, Goodyear is able to group mold records so that all molds of the same type are shown in the same recorder. This is designated with the size and type of tube. One observer watches all records as they are made and is able to tell molding supervisor whenever any production lag crops up.



Eleven recorders are used. Each shows on and off periods for 20 Donut molds

Results: Primary objective of an accurate count has been achieved. Fact that observer knows of production troubles before mold supervisor was surprising at first, but has been an unlooked-for advantage. Records in themselves are valuable, as objective statements of what actually did happen during production changeovers, etc.

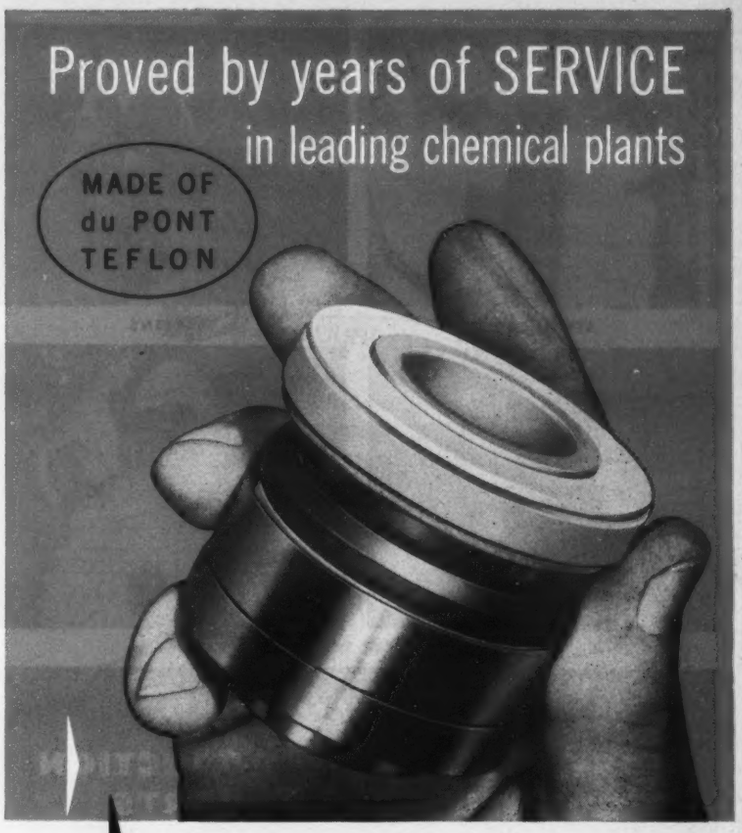
(Operation Recorders used in this installation are products of The Esterline-Angus Co., Inc., Dept. CP, P. O. Box 596, Indianapolis 6, Ind. . . . or for additional information about manufacturer's product, reader may simply check CP 7870 on convenient Reader Service slip which is located opposite last page.)

✦ ✦ ✦

THAT'S INTERESTING

Cheesy trick ages switches

Those noiseless mercury switches, like good cheese, must age before they are at their best. Sluggishness caused by moisture in the mercury tube will show up after manufacture if the switch has rested for 48 hours. Inspectors of the Micro Switch Div. of Minneapolis-Honeywell in Freeport, Ill., looked around for a place to "age" their products undisturbed, like cheese. The logical answer — an old cheese aging room formerly used by a national dairy manufacturer.



CHEMISEAL SHAFT SEALS

Customers report unsurpassed performance and much longer life under a wide variety of chemical service conditions, with Chemiseal Mechanical Seals.

A superior material—duPont TEFLON, and a one-piece balanced bellows design are responsible.

Chemiseals rotate with shaft. Only bearing surface is between precision ground stationary and rotating faces—the latter being an integral part of the TEFLON bellows unit.

Advantages include: Applicable to all chemical requirements, including clear, abrasive and tarry materials. Seal drop-tight and stay tight. Low friction load on shaft. No scoring of shafts—shafts already scored can be satisfactorily sealed. Pressures at the seal to 100 psi at 75° C or 75 psi at 100° C. Standard sizes ⅜" to 2⅛". Other sizes on special order. Over-all length 2½".

Write for Bulletin No. MS-954.

UNITED STATES GASKET CO., Camden 1, N. J.

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FOR FABRICATED PARTS call your Cambridge Engineers in the field, or call our home office. We'll help you select weaves, mesh sizes and metals to meet your needs and draw up prints for your OK . . . or, work from your prints. On small or large orders, you're assured of strict adherence to specifications by close manufacturing supervision.

A COMPLETE LINE of industrial wire cloth is available from Cambridge . . . specifications from the finest to the coarsest mesh in any metal or alloy. Uniform mesh size and accurate mesh count are assured by individual loom operation and careful inspection.

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You can get IMMEDIATE DELIVERY on large or small orders for the most frequently used types of cloth. If your needs are not in stock, we'll schedule our looms to get your material to you without delay.

LET US QUOTE on your next order for fabricated parts or wire cloth in bulk. Call your Cambridge Field Engineer—he's listed under "Wire Cloth" in your classified telephone book.

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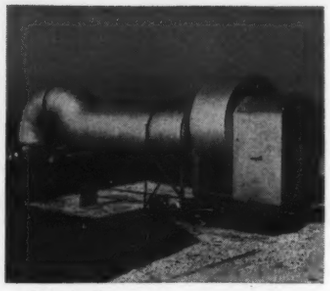
When inquiring check CP 7872 opposite last page

NEW SOLUTIONS

Hydrochloric and nitric, chromic acid fumes handled by fan . . .

blower still good as new after 1½ years service

Corrosive bright dip-plating fumes haven't hurt blower at Eversharp, Inc., Chicago, Ill., placed in service in Feb. 1954. Fan was installed by company in connection with a gold-plating operation when production was started on a new injector razor, known as the Hydro-Magic.



Baked phenolic coating protects interior of fan from corrosion

Fumes come from the plating solution, which consists of a mixture of two parts sulfuric, one part nitric acid, some chromic acid.

Reason blower has stood up well is because interior of housing, the wheel, and inlet cone are coated with Lithcote, a corrosion-resistant, baked phenolic coating. Unit is a standard size 4½′ fan, with a wheel diameter of 27″. Wheel is backward blade, non-overloading design. Fan housing is supplied with a drain plug for removal of condensation. Blower has a capacity of 16,000 cfm although at present it is being used at 8000 cfm.

Eversharp also uses four other blowers made by same manufacturer, all of which are giving good service. One neoprene-coated unit is used for exhausting detergent fumes from cyanide gold plating. The others are used respectively for lacquer fumes, buffing machine wastes, hard rubber particles.

(Fans manufactured by General Blower Co., Dept. CP, Morton Grove, Ill. Check CP 7873 opposite last page.)

ANNOUNCING

POLITOL

for purer fats and oils

Now, after years of research and development, POLITOL is offered to the fats and oils industry to simplify refining and increase product purity.

advantages:

1. **Removal of proteinaceous bodies and other impurities, yielding color and odor stability.**
2. **Lighter initial color plus greater susceptibility to bleaching.**
3. **Possibility of partial neutralization without usual difficulties in soapstock separation.**
4. **Removal of trace metals present as oil-soluble soaps.**

grades:

POLITOL S — water-soluble for primary treatment of crude.

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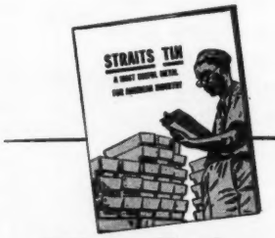
Send for technical Bulletin 501, giving laboratory and plant run methods and results.

Polychemicals DIVISION

West Virginia Pulp and Paper Company

CHARLESTON A, SOUTH CAROLINA

When inquiring check CP 7874 opposite last page



Get This Informative Free Booklet on New Uses for Straits Tin

New, 20-page booklet tells important story of Straits Tin and its many new uses today. Fully illustrated. Includes sections on new tin alloys, new tin solders, new tin chemicals. Covers tin resources and supply, Malayan mining. Booklet is factual, informative—could well prove profitable to you. Mail coupon now.

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When inquiring check CP 7875 opposite last page

West Virginia Pulp & Paper protects pulping digesters with weld overlay . . .

stainless beads prevent localized corrosion in most vulnerable areas

Problem: Top head and bottom cone areas of carbon steel pulp digesters were subject to localized corrosion at West Virginia Pulp and Paper Company. Digesters are used in conjunction with the operation of normal kraft mills. Solutions handled consist mainly of sodium hydroxide and sulfide at 130 psi and about 360°F.



Section of stainless steel weld overlay which protects pulping digesters

Solution: Approximately one year ago when three new digesters were placed in operation at Luke, Maryland, they were protected by the application of a thin stainless steel weld overlay in areas most vulnerable to corrosive attack. Weld overlay consists of hundreds of separate beads applied close together to give the effect of a solid sheet of stainless steel. Method does not adversely affect the strength properties and life of the shell itself.

Requirements called for three digesters, each 11′ in diameter and 43′ high. Weld overlay was applied to a portion of the top shell and head plates in each of these vessels. Although in this case, weld overlay was applied to new digesters, it was originally developed for older vessels when indications of corrosion were evident in certain areas.

Results: Digesters have given good service since they were placed in operation.

(Method of using stainless steel weld overlay is a development of Crucible Steel Co. of America, Dept. CP, Oliver Bldg., Pittsburgh, Pa.)

(Pulp digesters were fabricated and weld overlay applied to them by Graver Tank & Mfg. Co., Inc., Dept. CP, 4809-11 Tod Ave., East Chicago, Ind. Check CP 7876 opposite last page.)

Is One of These Your Dust Problem?

Check this list of AAF Dust Control Equipment applications covering a typical *one month* period.



FOUNDRY

Sand Conditioning System
Swing Frame Grinding
Electric Furnace Fumes
Portable Grinding
Vibrating Shakeout



CHEMICALS

Rotary Kiln — Bagging
Drum Dryer — Hammer Mill
Ball Mill — Rotary Dryer
Material Handling
Fluid Energy Mill



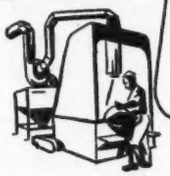


MINING AND ROCK PRODUCTS

Copper Ore Milling — Coal Dryers
Quarry Drilling — Coal Tipple
Zinc Concentrate Dryer
Bituminous Aggregate Dryer
Calcining Furnace
Coal Cleaning Plant
Underground Crusher
Taconite Ore Crusher

METAL WORKING

Thread Grinders — Belt Sander
Metalizing — Stand Grinding
Magnesium Grinding — Burring
Automatic Screw Machines
Automatic Buffing
Cast Iron Machining



MISCELLANEOUS

Woodworking — Fur Cleaning
Grain Bins — Plastic Dust
Paper Dust — Candy Mixers
Leather Brusher — Rayon Flocking
Laundry Dryers — Rubber Grinding
Sugar Granulator
Cream Cheese Concentrator
Ceramic Insulator Grinding

Any of the above "ring a bell"? If not, remember this list represents only one *month* in AAF's 23 years of dust control experience—all of which is readily available to help you find practical solutions to your dust problems. Why not call your local AAF representative now, or write—

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COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 258 Central Avenue, Louisville 8, Kentucky

When inquiring check CP 7877 opposite last page



Packaged in 50-lb paper bags —

rice-size polyethylene wax pellets are easy to handle, quick to melt

Two forms are available: emulsifiable, non-emulsifiable depending upon use

Uses: Emulsifiable-type polyethylene wax promises to be a major ingredient in self-polishing emulsion-type waxes for furniture and floor applications.

Non-emulsifiable type is for use in melt coatings, such as used for bread wraps and milk cartons, where it upgrades paraffin. In floor, auto, and shoe paste polishes, it increases gloss, hardness, scuff-resistance. Wax stiffens and raises melting point of candles. Other uses include: electrical applications, as a bodying agent in printing inks, as a calender release agent in rubber compounding, and as a flatting agent in lacquers.

Features: Wax is supplied in the form of small pellets, about the size of a grain of rice. Pellets are packaged in standard 50-lb multiwall paper bags, facilitating handling and speeding the melting-down process.

In many respects, wax is superior to other synthetic waxes, micro-crystalline waxes, and to many expensive natural waxes. Both forms are compatible with most commonly-used animal, vegetable, and mineral waxes. Polyethylene wax does not impare the physical properties of carnauba when blended with it.

The wax is effective in upgrading paraffins where it increases block resistance, hardness, melting point, flexibility, and dielectric properties. Perhaps the outstanding property is that it plasticizes other waxes.

Description: Epolene wax is basically a low mw polyethylene. It is supplied in two forms: an emulsifiable type (Epolene-E) and a non-emulsifiable type (Epolene-N). Typical physical properties are shown in the table, accompanying.

Emulsification can be effected by adding the wax to water, or adding water to the wax. The former method is more frequently used.

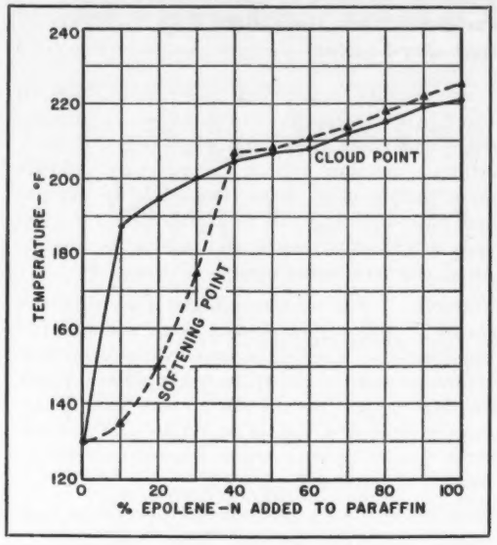
Typical Formulation For Emulsification

Ingredient	Parts
Epolene-E	83.3
Oleic acid	13.3
Morpholine	10.4
KOH	1.2
Water	725.2
Shellac soln (12% in ammonia water)	166.7

1 — Heat wax and oleic acid to 115-120°C, with agitation.
2 — Add the KOH dissolved in a minimum amount of water and stir until foaming subsides.
3 — Add amine, and cook at 110-115°C for 15 min.

Typical Properties of Polyethylene Waxes

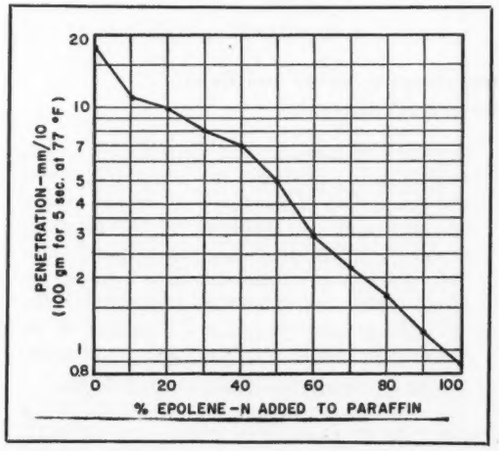
	Epolene-E	Epolene-N
Ring and ball softening point (°C, approx.)	102	106
Penetration hardness (0.1 mm, 100 gm for 5 sec @ 77°F)	<1	<1
Acid number	9-10	<1
Viscosity (Brookfield, cps @ 250°F)	1700-1800	1900-2000
Color (Gardner, of liquid)	2	1
Dissipation factor	—	$3\text{-}3\frac{1}{2} \times 10^{-4}$
Dielectric constant	—	2.36



Effect on cloud point and softening point of paraffin by adding various percentages of Epolene-N

4 — Pour molten wax into hot water (90-95°C) and agitate vigorously.
5 — When emulsion is formed, add shellac solution and cool rapidly to room temperature.
6 — Allow emulsion to stand for 24 hr, then filter.

(Polyethylene waxes are a product of Eastman Chemical Products, Inc., a Div. of Eastman Kodak Co., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . or for more information check CP 7878 on handy form opposite last page.)



Effect on penetration hardness of paraffin by adding various amounts of Epolene-N



The Oronite manufacturing process permits the consistent marketing of a highly pure Phenol. Exceeding the U. S. P. congealing point specification of 39.0° C, Oronite's guaranteed minimum is 40.6° C—with actual shipments being regularly higher. This dependable high quality, at competitive prices, suggests Oronite as a leading Phenol source.

Oronite, with complete control of all basic raw materials in its manufacturing process is truly a 100% *basic source* of supply. Thus with Oronite you are assured of a reliable Phenol source, service and product when you need it.

Contact any Oronite office for further product and supply information.

A partial list of Oronite Products

Detergent Alkane	Wetting Agents	Purified Sulfonate	Para-Xylene 95%
Detergent Slurry	Cresylic Acids	Polybutenes	Ortho-Xylene
Detergent D-40	Gas Odorants	Acetone	Xylol
Detergent D-60	Lubricating Oil Additives	Naphthenic Acids	Aliphatic Acid
Dispersant NI-O		Phthalic Anhydride	Hydroformer Catalyst
Dispersant NI-W	Sodium Sulfonates	Maleic Anhydride	Fuel Oil Additives

ORONITE CHEMICAL COMPANY

Basic Chemicals for Industry

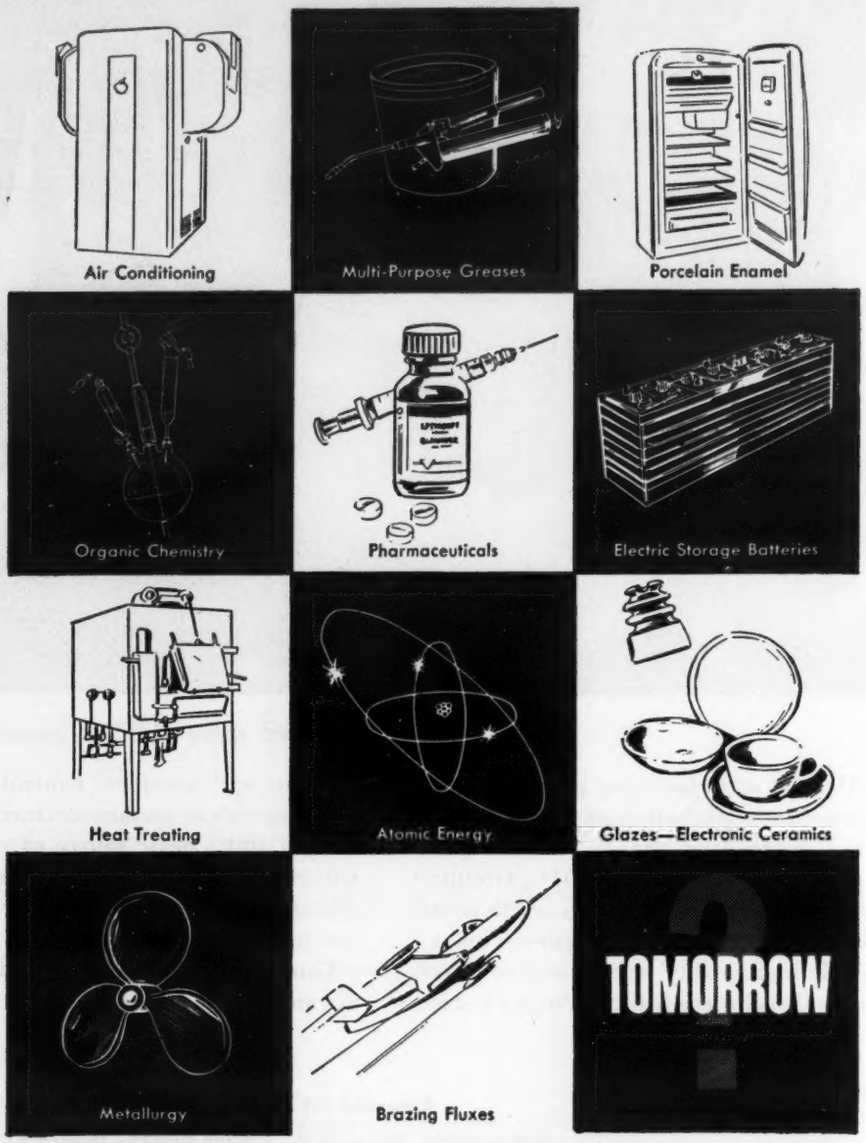
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When inquiring check CP 7879 opposite last page

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When inquiring check CP 7880 opposite last page

Hexanetriol used as intermediate for plasticizers, isocyanate and alkyd resins

Uses: Big application is in production of foamed isocyanate resins. Production of polyurethane and alkyd resins, and plasticizers for nitrocellulose, cellulose acetate, and polyvinyl chloride are also important. It is comparable to glycerol and polyethylene gycols as a plasticizer for glues and water-soluble resins and should be investigated as a moistening agent.

Features: The isocyanate foams are resistant to chemicals and fire, impervious to oil, and are good heat-insulators. Compound imparts improved heat-resistance and durability to polyurethane resins. Coatings made from the alkyd resins should have greater flexibility and good water- and solvent-resistance. Plasticizers impart flexibility, better resistance to cold-cracking.

Description: Hexanetriol-1,2,6 is now in commercial production and has these properties:

Sp gr (20°/20°C)	1.1063
Boiling point (°C @ 5mm Hg)	178
Vapor pressure (mm Hg @ 20°C)	<0.01
Viscosity (cps @ 40°C)	512
Refractive index (n_D^{20})	1.4771
Flash point (°F, COC)	380
Freezing point (°C)	Sets to glass below −20

Procedure to make isocyanate resin is first to react hexanetriol with a dibasic acid to form polyester resin. This is then reacted further with a diisocyanate to form a resin intermediate with two free —NCO groups. Reaction with water gives off CO_2 which causes resin to foam and crosslink.

(Hexanetriol is a product of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 7881 on handy form opposite last page.)

Handbook answers questions on organic solvents

Properties of many organic solvents, the applications of such properties, definitions of trade terms, and descriptions of standard tests are presented in 68-page handbook. Discussed are the petroleum naphtha solvents, aromatics, and terpenes; alcohols, glycols, and amines; esters, ketones, and glycol ethers; and chlorinated solvents. Included since the previous edition are a number of the chlorinated solvents, naphthas, and glycol ethers.

"Organic Solvents Handbook — 1955 Edition" is issued by Central Solvents & Chemicals Co., Dept. CP, 2540 W. Flournoy St., Chicago 12, Ill. When inquiring specify CP 7882 on handy form opposite last page.

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

U.S.I. ISOSEBACIC* ACID OFFERED FOR EVALUATION

New Synthetic Chemical Now Available in Pilot Plant Quantities

U.S.I. Isosebacic acid, a new synthetic organic chemical, is now being produced in pilot plant quantities for evaluation by research and development groups throughout the chemical industry.

This new product is a mixture of isomers of sebacic acid in the proportions indicated below and promises to be of great interest to users of dibasic acids in general. The product of more than three years of intensive research in laboratory and pilot plant, U.S.I. Isosebacic acid is produced by a novel synthetic process, starting from metallic sodium and butadiene. Both of these raw materials are readily available in large quantities and have a long history of price stability. Although U.S.I. Isosebacic acid is currently priced at 45 cents per pound for development quantities, it is expected that large scale production in a commercial plant will make substantial price reductions possible in the future.

Many promising uses

One of the most promising uses for U.S.I. Isosebacic acid is the manufacture of high quality plasticizers for vinyl resins, particularly where low temperature flexibility is required. U.S.I. Isosebacic acid esters of isooctyl alcohol or 2-ethylhexanol have been found to have superior properties in this

MORE

U.S.I. Assumes New Responsibility

National Distillers Products Corporation recently announced that all chemical operations of the company will be conducted by the U. S. Industrial Chemicals Co. Division. Previously U. S. Industrial Chemicals Co. was part of the Chemical Division of National Distillers. The two have now been consolidated under the U.S.I. name.

The organization and name of National Petro-Chemicals Corporation, 60% owned subsidiary, will remain unchanged. "Petro" will continue to be managed by National Distillers, now through U.S.I.

New Polyethylene Booklet

U.S.I. has just issued a booklet on PETROTHENE polyethylene resins as raw materials for the plastics processor. PETROTHENE is offered in pellet form in both high quality and general purpose resin types. The booklet describes the product, its properties, production, uses, methods of processing (extrusion, injection and compression molding) and fabricating. U.S.I. services to the plastics processor are outlined. Copies on request.

Warts Successfully Treated with Oral Methionine

Recent work in the United States has confirmed the fact that methionine can be used to treat warts. The American work confirms previous findings to the same effect made in France. Patients with warts were given methionine orally at the rate of 1 to 2 grams per day. The warts usually disappeared within ten days after treatment began. This effect of methionine was discovered accidentally when a patient with warts was given methionine for hepatitis. During the course of treatment, the warts disappeared.

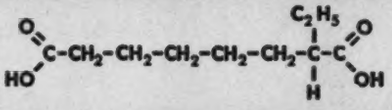
Anhydrous Ammonia Reported Useful as a Fungicide

Recently completed research indicates that in addition to its primary use as a fertilizer, anhydrous ammonia also acts as a fungicidal agent in the soil. The researchers found that only 0.6% of the nematodes and 4.9% of the fungi survived when 608 ppm of nitrogen were present in the soil. This level of ammonical nitrogen is reported to occur regularly in the retention zone when anhydrous ammonia is applied to fields.

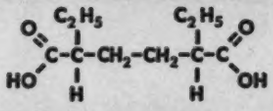
Although the numbers of nematodes and fungi were reduced by levels of ammonical nitrogen as low as 136 ppm, the largest reduction in both nematodes and fungi occurred when levels were above 365 ppm.

U. S. I. ISOSEBACIC* Acid
a mixture of C_{10} Dicarboxylic Acids

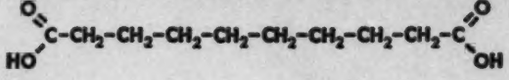
α ethyl suberic acid — 72 - 80%



α,α' diethyl adipic acid — 12 - 18%



sebacic acid — 6 - 10%



*TRADE MARK

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U.S.I. CHEMICAL NEWS

CONTINUED

U.S.I. Isosebacic Acid

respect. These same esters also show great promise as base materials for the synthetic lubricating oils now required by jet aircraft engines. Especially important for such a national defense application is the fact that U.S.I. Isosebacic acid will be produced entirely from domestic raw materials which are in ample supply.

For polymeric plasticizers

Polymeric plasticizers, made from glycols and long chain dibasic acids, are another promising application for U.S.I. Isosebacic acid. Because of their superior low volatility and non-migration properties, polymeric plasticizers have become increasingly popular with vinyl resin converters and compounders in recent years. The availability of U.S.I. Isosebacic acid will make possible development of new and cheaper polymeric plasticizers.

Seen useful for polyesters

U.S.I. Isosebacic acid will also be of interest to producers of polyesters for coupling with diisocyanates in the production of polyurethane foams, elastomers, adhesives and surface coatings. Other polyesters, made from U.S.I. Isosebacic acid and glycols also show promise as raw materials in the production of resins for reinforced plastics.

There are many other applications where U.S.I. Isosebacic acid may be used. Samples are available for evaluation on laboratory or pilot plant scale. For samples, data sheets and technical assistance, write to the Editor, U.S.I. Chemical News.

Urethan a Synergist In Retarding Cancer

Recent experimental evidence indicates that urethan combined with nitrogen mustard compounds or triethylene melamine may inhibit cancerous growths which do not respond to these materials used alone. Such findings have been observed in animals with experimental tumors, and there are indications that there may be regressions of some human tumors from such action. It is emphasized, however, that the remissions so induced are of a temporary nature. Additional studies are being conducted further to evaluate this treatment and its side reactions.

Metallic Sodium Purifies Petroleum . . . Product Recovery High

It has been established that the treatment of petroleum fractions with metallic sodium has several beneficial effects. All types of sulfur compounds are removed, particularly thiophenic sulfur, difficult to eliminate with other treating agents.

In addition to desulfurizing, sodium improves odor, color, and storage stability, and reduces "dissolved" gum-formers. The sodium treating process has the advantage of producing a high-quality product with little loss of volume.

Sodium in one of the finely divided forms developed by U.S.I. — sodium dispersions in inert hydrocarbon media, or sodium coated on inert solid particles — are especially suitable for this application. Both of these procedures are easy to use, and little additional equipment is needed. Specialty solvent and oil manufacturers find this treatment particularly attractive.

New Film Shows Advantages of Ohio as Plant Site

The Cleveland Electric Illuminating Company has produced a 28-minute sound film in color called "Land of Promise," which outlines the recent rapid growth of industry in Northeast Ohio. The film indicates that chemical enterprises in particular have been drawn by the nearness of plentiful power, water, labor, land, materials and markets. And the finalizing of plans for the St. Lawrence Seaway now holds forth the promise of direct access to *world* markets and materials.

Among the plants which located early in the area and attracted other producing units to it can be numbered the U.S.I. sodium plant at Ashtabula. Since its startup in 1950, units have been constructed by other companies at Ashtabula which use U.S.I. metallic sodium and chlorine.

The film can be obtained for showings from Cleveland Electric Illuminating Company at 83 Public Square, Cleveland.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

For testing interior temperatures of products during processing, new temperature indicators, consisting of heat-sensitive papers sealed in glass tubes, are available. At a predetermined point, the paper changes from white to black irreversibly, leaving a permanent record. **(No. 1090)**

A new silicone mold release emulsion for rubber, plastics and metal is more stable to creaming or separation than any comparable silicone developed thus far. **(No. 1091)**

Polyethylene squeeze bottles now feed a new type ink to recording instrument pens. A plastic capillary-tube spout on the bottle pinpoints a precise quantity of ink onto the pen without dripping. **(No. 1092)**

A rubber compound for sealing high vacuum equipment, recently developed, has good resistance to out-gassing at high temperatures, and long service life. It is a formula of Buna N Polymer, moldable in special and standard shapes. **(No. 1093)**

Alcohol-saturated cotton sponges may now replace the bottle of alcohol and the box of cotton in the doctor's bag. The sponges come in jars of 30, 150 and 250; also contain other disinfectants. **(No. 1094)**

A rust remover, shipped in powdered form, is proving unusually effective for ferrous and nonferrous metals. Mixed with water to any desired strength, it is fast-acting, nontoxic, nonflammable, leaves a thin, rust-resistant coat. **(No. 1095)**

A new plastic foam can be produced in lighter densities than other foams, making it suitable for lightweight product uses. It has high tensile, tear and compression qualities excellent for cushioning heavy loads. **(No. 1096)**

Bursting strength of polyethylene pipe tends to increase with higher loadings of carbon black, according to preliminary tests. If the findings prove valid, the plastic pipe might substitute for steel in many applications. **(No. 1097)**

To protect feet against temperature extremes, a new safety shoe has been developed. The upper is padded with foamed vinyl containing countless "sealed-air" bubbles. The vinyl does not absorb moisture, oil or odors. **(No. 1098)**

A new type laboratory rod support is now offered which attaches to any vacant space along a lattice rod without disturbing apparatus already set up. From the clamp another rod can be extended to support additional apparatus. **(No. 1099)**

PRODUCTS OF U.S.I.

ALCOHOLS
Butanol (Normal-Butyl Alcohol)
Fusel Oil — Refined

Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof U. S. P., Absolute—200 Proof
Filmex*—special proprietary solvent
Solox*—proprietary solvent—regular and anhydrous

ETHERS
Ethyl Ether, U. S. P.
Ethyl Ether, Absolute—A.C.S.

ACETONE—A.C.S.

ANSOLS
Ansol* M
Ansol* PR

ACETIC ESTERS
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate

OXALIC ESTERS
Diethyl Oxalate

OTHER ESTERS
Diatol*
Diethyl Carbonate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

FEED PRODUCTS
Calcium Pantothenate (Feed Grade)
Choline Chloride Products
Curbay B-G* 80
DL-Methionine (Feed Grade)
Niacin, U.S.P.
Riboflavin Concentrates
Special Liquid Curbay*
U.S.I. Vitamin B_{12} and Antibiotic Feed Supplements
Vacatone* 40
Vitamin A, D_3, and K_3 Products

PLASTICS
Petrothene** Polyethylene Resins

OTHER PRODUCTS
Anhydrous Ammonia
Caustic Soda
Ethylene
Liquid Chlorine
Metallic Sodium
DL-Methionine (Pharm.)
N-Acetyl DL-Methionine
Nitrogen Solutions
Propionic Acid
Sulfuric Acid
Urethan, U.S.P.

*Reg. U.S. Pat. Off.
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Promotes fire-resistance in paint and plastics, is non-reactive . . .

two forms are available, differ in tinting strength

Uses: In paint and plastics as pigment and fire-retarding agent.

Features: Pigment is of high quality, non-reactivity, and excellent whiteness. Pigment-type promotes resistance to film breakdown by actinic light.

Description: Pigment type KR Antimony Oxide has high opacity, and is used with TiO_2 or ZnO or both in durable finishes. It is suitable for fire-retardant paints, wherever specs call for antimony oxide.

Low Tinting Strength type KR has 40% lower tinting strength than the above, and is used in colored fire-resistant compositions. Minimum of whitening influence permits large amounts to be used, if desired.

(Antimony oxides are a product of The Harshaw Chemical Co., Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio. Check CP 7883 opposite last page.)

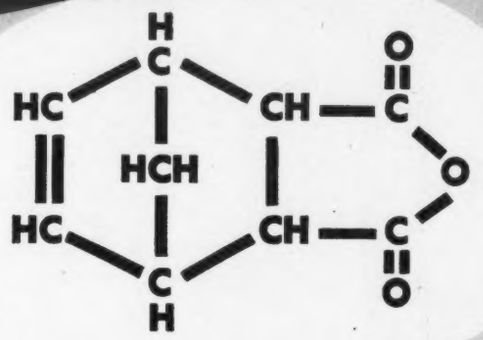
Symposium on odor

Nomenclature, measurement, and control of odors present unique problems. ASTM Committee D-22 devotes attention to this subject. Symposium which includes papers presented at 57th Annual Meeting in 1954 is available at $2.25 a copy from American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

For more information on product at right, specify CP 7884 . . . see information request blank opposite last page.

For more information on product at left, specify CP 7885 . . . see information request blank opposite last page.

have you evaluated
NATIONAL "NADIC" ANHYDRIDE
for polyesters, resins, plasticizers, surface coatings and similar syntheses?

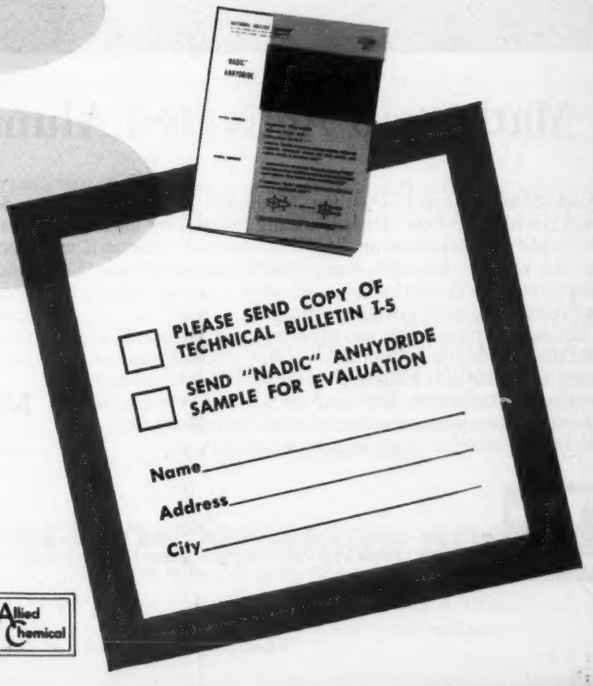


Since we announced this unique intermediate a year ago much interesting application work has been done. Its use has grown encouragingly. But the possibilities of this unsaturated dicarboxylic anhydride with a cyclic structure are far from completely explored.

Have you considered how you can capitalize upon its reactive double bonds and the many opportunities for cross linkage? We will be pleased to cooperate fully with those whose work may lead to expanded commercial use of "Nadic" Anhydride.

WRITE FOR TECHNICAL BULLETIN I-5

This 12-page digest of the properties, reactivity and suggested uses of "Nadic" Anhydride also includes a list of 68 literature references. It should be a helpful springboard to progress on current uses and future applications. A copy will be sent without cost or obligation.



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Mathieson Activated Alum: *settles water treatment problems*

Quick-dissolving and fast-settling, Mathieson sulphate of alumina is a superior filter alum specifically designed for industrial water and wastes treatment. Its porous structure enables it to go into solution fast. The finely ground natural silicates aid coagulation, form heavier floc, and allow a greater volume to be processed in each treatment period.

In chemical plants, pulp and paper mills, petroleum refineries, Mathieson Activated Alum is providing efficient, economical water treatment and helping to solve sensitive wastes disposal problems. Mathieson's technical service staff is available for advice and practical assistance on application and handling of sulphate of alumina in all industrial installations.

See if Mathieson Chemicals can't settle your water and waste treatment problems. In addition to Activated Alum, Olin Mathieson is a major producer of chlorine, ammonia, sodium chlorite (chlorine dioxide), HTH hypochlorite products, sulphuric acid, hydrazine, caustic soda, and powdered and fused soda ash (PH-Plus). Your Mathieson representative will put you in touch with the men who can best serve you—or write today for complete information.

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When inquiring check CP 7886 opposite last page

Effectively thickens synthetic latices, has constant viscosity on aging . . .

agent is not affected by high pH values or elevated temperatures

Uses: Agent thickens butadiene-styrene, unplasticized styrene, vinyl chloride, and vinyl acetate latices for applications in dipped, cast, or molded goods, adhesives, cements, and spraying, brushing, and extruding compounds.

Features: In concentrations of 1% or less, agent is 3 to 20 times more effective, (based on final viscosity) than conventional thickeners. Thickened latices have excellent storage stability, do not undergo phase separation or creaming. Viscosity is constant with aging, and is not affected by high pH values and elevated temperatures.

Description: Acrysol G-110, an ammonium polyacrylate solution, has 22% solids. pH is 8.5-9.5. Viscosity of a 5% solids solution is 150-250 cps. Material is a colorless, slightly hazy liquid which produces a hard, clear film when dry.

(Thickening agent is a product of Resinous Products Div., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. . . . or for more information about manufacturer's product reader may simply check CP 7887 on handy form which is located opposite last page.)

Information on diisocyanates

Product information on bitolylene diisocyanate (TODI) and dianisidine diisocyanate (DADI) is contained in nine-page technical bulletin. Available in semi-commercial quantities, they are used in foams, adhesives, fibers, elastomers and resins for coating and molding, and modification of certain products. Properties and toxicity are discussed.

For applications which cannot tolerate use of solvents but which require a liquid diisocyanate, tolylene diisocyanate mixtures can be added to TODI. Two-phase diagrams show effect of these mixtures on melting point.

Although quite reactive, presence of a substituent adjacent to each isocyanate group has a moderating effect, allowing greater latitude in time-temperature relationships in reactions. Information of relative reactivity of a series of biphenylene diisocyanates in comparison with tolylene diisocyanate is shown in a full-page chart. A detailed bibliography is also included.

"Diisocyanates" is issued by The Carwin Co., Dept. CP, North Haven, Conn. When inquiring about manufacturer's product reader may simply specify CP 7888 on convenient Reader Service slip opposite last page.

Lead tallate drier is light in color, cold-stable

Uses: As a drier in paint formulations.

Features: Compound is light in color, and has low viscosity. Cold stability is excellent.

Description: Advasol lead tallate drier (16% lead) has these properties:

Metal content (%)	15.8-16.2
Solids (% max)	47
Viscosity (Gardner)	<A
Sp gr (@ 75°F)	0.995-1.01
Color (G-H, max)	8

There is no precipitation with a minimum change in viscosity at temp as low as 0°F. Extremely mild odor enhances value for "odor-free" paints.

(Lead tallate drier is a product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Ave., New York 16, N.Y. . . . or for more information check CP 7889 on the convenient Reader Service slip which is located opposite last page.)

Anti-static protection for synthetic fabrics

Lasting anti-static protection for synthetic fabrics, even after repeated washing and dry cleaning, is provided by chemical. It has no effect on the hand of the fabric. Material is applied by padding and fixed on the fabric by heat treatment. It can be used in conjunction with crease-resistant or water-repellent finishes.

(Niatex Anti-Static AG-1 is available from Carbide and Carbon Chemicals Co., Div., of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, New York. . . . or for more information check CP 7890 on handy form opposite last page.)

For more information on product at right, specify CP 7891 . . . see information request blank opposite last page.

You get a carload of

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WITCO STEARATES

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FOR PAINTS, VARNISHES AND LACQUERS

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Among the many stearates produced by Witco:

Aluminum (medium to extremely high gel), Barium, Lithium, Lithium Hydroxy, Calcium, Magnesium, Sodium, Cadmium, Zinc (regular and special grades)... plus many other stearates especially developed by Witco for specific uses in a host of industries.

Write for Stearates Bulletin 53-1, samples or technical service.

35 Years of Growth

More and more manufacturers are turning to Witco for their stearate requirements, because Witco gives them something extra. That something extra is assurance – and it comes right along with every stearate order that Witco delivers . . .

Assurance 1: Stearates supplied by Witco are manufactured in one of Witco's own plants, sold directly to the consumer by the producer.

Assurance 2: Witco's unsurpassed quality control guarantees purity and uniformity. A Witco stearate will give dependable repeat performance in any particular application.

Assurance 3: Technical service by Witco's experts is yours for the asking–service grounded in Witco's long and varied experience with stearates of every grade and type. If a stearate problem crops up, Witco will answer your call with prompt, efficient assistance.

WITCO CHEMICAL COMPANY

122 East 42nd Street, New York 17, New York

Chicago • Boston • Cleveland • Akron • Atlanta • Houston • Los Angeles
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CONSTANT SAMPLING ASSURES UNIFORMITY. Samples are drawn from the top, middle and bottom of every tank car and tank truck shipment. Sun files every purity analysis—available for your reference.

USERS REPORT BIG DIVIDENDS FROM HIGH-PURITY SUN AROMATICS

Processing easier, yields higher; all at no increase in price!

The higher purity of Sun's aromatics is already paying big dividends. Several Sun customers are reporting higher yields. Others claim they are getting better, more uniform products. One company reports they have been able to eliminate completely a purification step in processing—and still maintain the quality of their end product. And all these plants are getting these dividend-producing, higher-purity products at no increase in price!

The high purity of Sun's Benzene, Toluene and Xylene is no accident—Sun spent $15 million on a plant specifically designed to produce quality products. Rigid controls and constant testing assure you of the same uniform, high-purity products month in and month out.

Find out what dividends Sun aromatics can give you. Write Dept. CP-7

TYPICAL TESTS



BROMINE INDEX. The extreme sensitivity of this new test tells Sun Engineers when filters need changing—long before filter deterioration can affect the quality of Sun's aromatics. It assures you of both uniformity and high purity.



DISTILLATION RANGE. Every sample tested must fall within the narrow boiling range specified in ASTM Method D-850. Typical analyses show that Sun's aromatics usually have a much narrower boiling range than is required to pass this test.



PARAFFIN TEST. Sun Toluene is guaranteed to contain less than 0.5% paraffins—substantially below the ASTM maximum of 1.5%. Samples normally contain no measurable paraffin whatever.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY
SUNOCO®
PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL
Refiners of famous High-Test Blue Sunoco Gasoline

MATERIALS

Test insecticide solutions

Official test insecticide control solutions for use by manufacturers in determining relative efficiency of products by the Peet-Grady method are available from Chemical Specialties Manufacturers Assn., Dept. CP, 50 E. 41st St., New York 17, N.Y.

Hydrocarbon reforming production upped by catalyst . . .

reduces reaction temp by 100°F

Uses: As a catalyst in production of ammonia synthesis gases, controlled atmospheres, carrier and fuel gas, and for dissociation of ammonia.

Features: A twenty-five per cent increase in production capacity is found in making ammonia synthesis gas from natural gas by steam-reforming process. At previously-used rates, reaction temp can be reduced by 100°F without efficiency loss, saving fuel costs. Preshrunk, catalyst will shrink <5% at temp below 1850°F.

Description: G-29 catalyst contains approximately 27% Ni that becomes active in reforming of hydrocarbons at 1100-1850°F. It is generally supplied in form of ½" or ¾" extrusions having apparent gross densities of 84-80 lb/cu ft respectively. It also comes as ¾" rings.

(Ni-base catalyst is a product of The Girdler Co., a Div. of National Cylinder Gas Co., Dept. CP, 224 E. Broadway, Louisville 1, Ky. . . . or for more information check CP 7892 on handy form which is located opposite last page.)

For more information on product at left, specify CP 7893 . . . see information request blank opposite last page.



KILL IT *with a*
DOW CORNING SILICONE DEFOAMER

Use the space now wasted on foam to increase your output by as much as 100%. For example:

- **production of vacuum concentrated food product increased by 60%**
- **refinery still through-put increased from 1500 to 2500 barrels per day**
- **yield of textile vat dyes increased by 100%**

And you get increased production immediately without installing expensive new equipment. All you have to do in the case of most foamers is add a few parts per million of the water dilutable Antifoam AF Emulsion or, where solvents can be tolerated, a dispersion of Antifoam A. Both of these Dow Corning silicone defoamers are physiologically harmless. Both of them **increase production • reduce processing time • eliminate the waste and fire hazard of boil-overs.**

see for yourself!
mail coupon today for
free sample

DOW CORNING SILICONES
Dow Corning Corporation
Midland, Mich., Dept. 3207

Please send me data and free sample of
☐ Dow Corning Antifoam A *Compound*
or ☐ Dow Corning Antifoam AF *Emulsion*

NAME_____
COMPANY_____
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CITY_____ ZONE____ STATE____

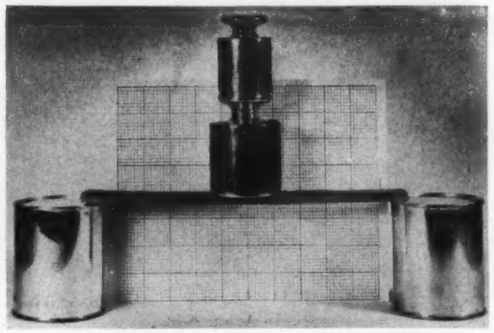
When inquiring check CP 7894 opposite last page

When bonded together with resins, microscopic phenolic spheres make lightweight foams . . .

structures can be laminated or cast, have densities from 10 to 39 lb/cu ft

Uses: Controlled cellular plastic finds uses in sandwich constructions, castings, and low-density aggregates. Potential applications include airplane wing structures, casings for air conditioning units and refrigerators, plastic boats, gun stocks.

Features: Material combines strength and light weight with minimum costs. Unlike conventional plastic foams, these structures can be controlled



Foot-long Syntactic foam sandwich between polyester-glass reinforced fabric shows little bending

throughout production. Exceptionally uniform cellular structures, free of voids or dense areas, are produced. Putty-like in consistency, uncured foam can be molded to shape, trowelled on to suitable surfaces, and forced into cavities, as well as being pressed in sandwich core structures.

Description: Called Syntactic foam, it is prepared by bonding microscopic phenolic spheres (Microballoons, see CHEMICAL PROCESSING, April 1954, page 55) together with polyester, phenolic, or epoxy resins. Lightweight foams ranging from 21 to 39 lb/cu ft are produced quickly and economically. Foams ranging from 10 to 14 lb/cu ft, known as featherweights, are being tested.

The Microballoons provide thermal insulating properties. Castings provide insulation at reduced material costs without adding appreciable weight. Test results show upper limit in which spheres can be used in foam is 40% by wt or about 70% by volume.

Flex strengths of sandwich structures between glass fiber mats reinforced with polyester resins are in the 1700-4500 psi range. Tensiles are between 1600 and 2900, and compressive strengths are as high as 12,100 psi.

(Syntactic foams are a development of Bakelite Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 260 Madison Ave., New York 16, N.Y. . . . or for more information check CP 7897 opp. last page.)

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CRYSTAL UREA
(CARBAMIDE)

Anhydrous Ammonia
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Sodium Nitrate
Methanol
Ethanolamines
Urea
Ethylene Oxide
U.F. Concentrate–85
Ethylene Glycols
Nitrogen Tetroxide
Formaldehyde
Nitrogen Solutions
Fertilizers & Feed Supplements

When you tie up with the Nitrogen Division you get much more than the highest purity Crystal Urea . . .

a **With plants located at South Point, Ohio, and Omaha, Nebraska, you are always assured of adequate supply.**

b **The technical know-how of the world's largest producer of Urea is yours for the asking.**

c **With close quality control starting with the basic raw material—Ammonia—you are assured of uniform quality, shipment to shipment.**

d **Fast shipping service whether by carload or truckload out of our two producing plants or by L.C.L. from conveniently located stocks in principal cities is unsurpassed.**

Nitrogen Division Crystal Urea is packed in 100-pound net moisture-proof, multi-wall paper bags.

Call or write today for sample and product bulletin or Technical Service on your application problem.

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Hopewell, Va. • Ironton, Ohio • Orange, Tex. • Omaha, Neb.

When inquiring check CP 7898 opposite last page

CHEMICALS FOR INDUSTRY

As basic producers of Copper, Iron, Zinc and Sulfur, we maintain exacting ***QUALITY CONTROL*** from the raw material to the finished product. You can be assured of ***UNIFORM QUALITY*** if it bears the **TC** label.

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SULFUR DIOXIDE
COPPER HYDRATE
MONOHYDRATED ZINC SULFATE
CUPRIC CHLORIDE
CUPRIC OXIDE
CHLOROSULFONIC ACID
MANGANESE SULFATE
ORGANIC SULFONIC ACIDS (AND DERIVATIVES)
MONOHYDRATED MANGANESE SULFATE

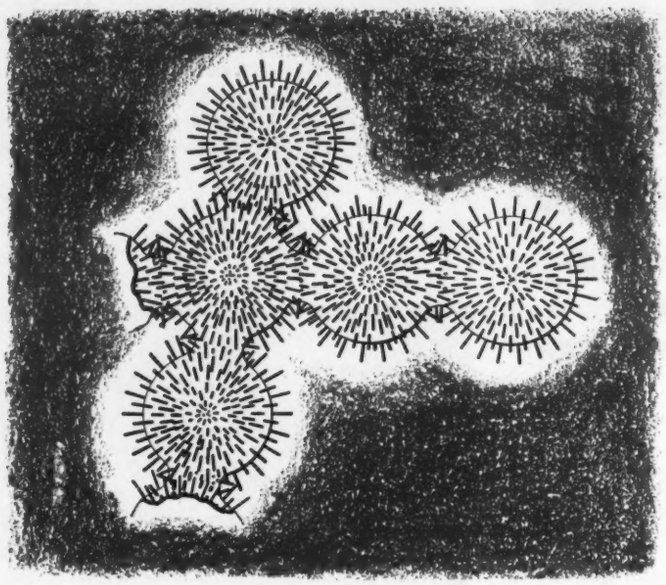


Samples, specifications and detailed information upon request

TENNESSEE TC CORPORATION

617-29 Grant Building, Atlanta, Georgia

When inquiring check CP 7899 opposite last page



Here's how the silica substrate is esterified

Surface of synthetic silica esterified with a monohydric alcohol to give —

hydrophobic, oil-wettable inorganic reinforcing agents

Having small particle size, compound is readily wet by organics, and is easy to disperse by conventional means

Uses: As a reinforcing and thickening agent in elastomers. Other applications include its use to increase stiffness of polyethylene, raise modulus of synthetic fibers, as a reinforcing filler in organic-base adhesives, and as a thickening and moisture-resistant reinforcing agent in various protective coatings and inks.

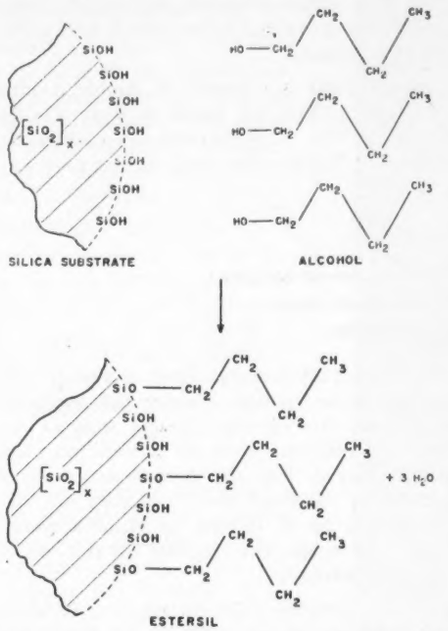
In solvent-type waxes, compound increases slip-resistance, buffability, and decreases tack. In silicone rubbers, it is a good reinforcer.

Features: Tear strength, abrasion resistance, modulus, and toughness of elastomers are improved. In certain cases, it will also increase impact and scratch resistance. Up to 50% of this product can be incorporated into polymers without seriously imparing clarity. Ease of incorporation, resistance to moisture breakdown, and gelling efficiency give it advantages as a viscosity control agent.

Other advantages accrue from its pronounced hydrophobic and organophilic characteristics. It is readily wet by organics so dispersion is easy with conventional milling procedures. Reinforcement is outstanding in many materials. Handling is facilitated by its granular form.

Description: Valron Estersil thickening agent is a loosely pelletized frm of synthetic, finely di-

vided spherical amorphous silica. Aggregated into open sponge-like networks, the active silanol groups on the silica surface are esterified with a monohydric alcohol, as illustrated. Conversion of the water-attracting silanol groups to alkoxy (—OR) groups accounts for the pronounced hydrophobic and organophilic



Aggregate of silica particles covered with alkoxy (-OR) groups is now organophilic

characteristics. Typical properties are shown in the table below.

Estersil is incorporated by adding the pellets to, say, a resin, and allowing the pellets to soak a short period to remove entrapped air. Mixture is milled with high shear. It may be feasible at times to reduce to a fine powder before mixing.

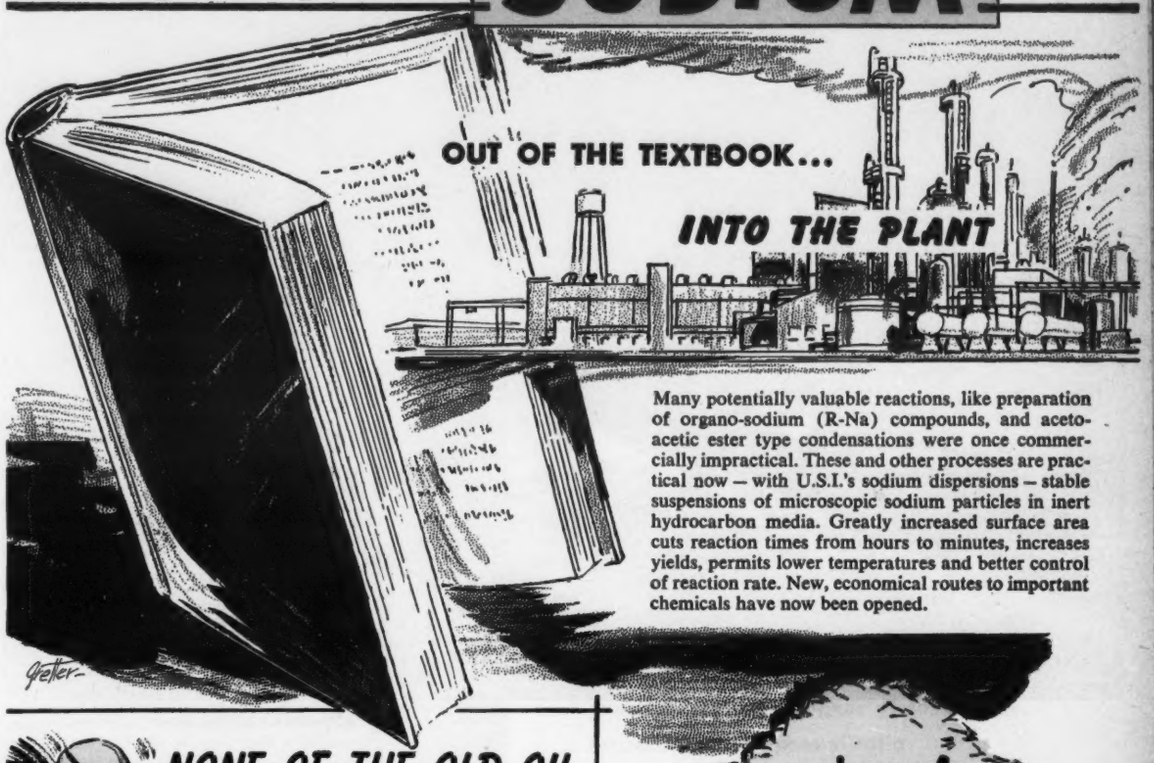
In general, thickening or gelling efficiency of Valron Estersil increases with decreasing polarity of system. In use, inhalation of any dust obtained by attrition should be avoided by using adequate ventilation supplemented by personal respiratory protection.

(Valron Estersil is available on semi-works scale from Grasselli Chemicals Dept., E. I. duPont de Nemours & Co., Dept. CP, Wilmington 98, Del. . . . or for more information check CP 7900 opp. last page.)

typical properties of valron estersil

Ultimate particle size (mμ)	8-10
Surface area (by N_2 adsorption, sq M/gm)	310
Bulk density (lb/cu ft, approx)	20
Color	white
SiO_2 (%)	88
pH (in 50-50 methanol-water mixture)	8.6
Water-soluble, non-siliceous ash (%)	<0.15

keeping up with **SODIUM**



Many potentially valuable reactions, like preparation of organo-sodium (R-Na) compounds, and aceto-acetic ester type condensations were once commercially impractical. These and other processes are practical now — with U.S.I.'s sodium dispersions — stable suspensions of microscopic sodium particles in inert hydrocarbon media. Greatly increased surface area cuts reaction times from hours to minutes, increases yields, permits lower temperatures and better control of reaction rate. New, economical routes to important chemicals have now been opened.



NONE OF THE OLD OIL

Contrary to a common impression, commercial sodium *is not* handled, stored or shipped under oil. U.S.I. ships sodium metal as dry bricks, in steel drums, and cast solid in drums and tank cars. Sodium bricks are handled safely in air. In fact, bricks are molded in the open because sodium does not burn below 120°C — (M.P. 97.5°C).

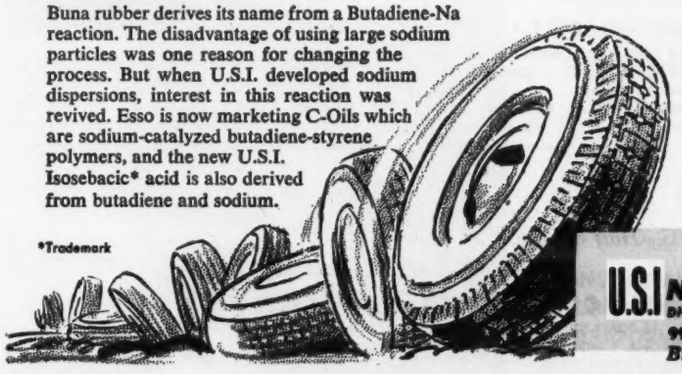
a heap of SODIUM produced each year



BuNa Vindicated

Buna rubber derives its name from a Butadiene-Na reaction. The disadvantage of using large sodium particles was one reason for changing the process. But when U.S.I. developed sodium dispersions, interest in this reaction was revived. Esso is now marketing C-Oils which are sodium-catalyzed butadiene-styrene polymers, and the new U.S.I. Isosebacic* acid is also derived from butadiene and sodium.

*Trademark

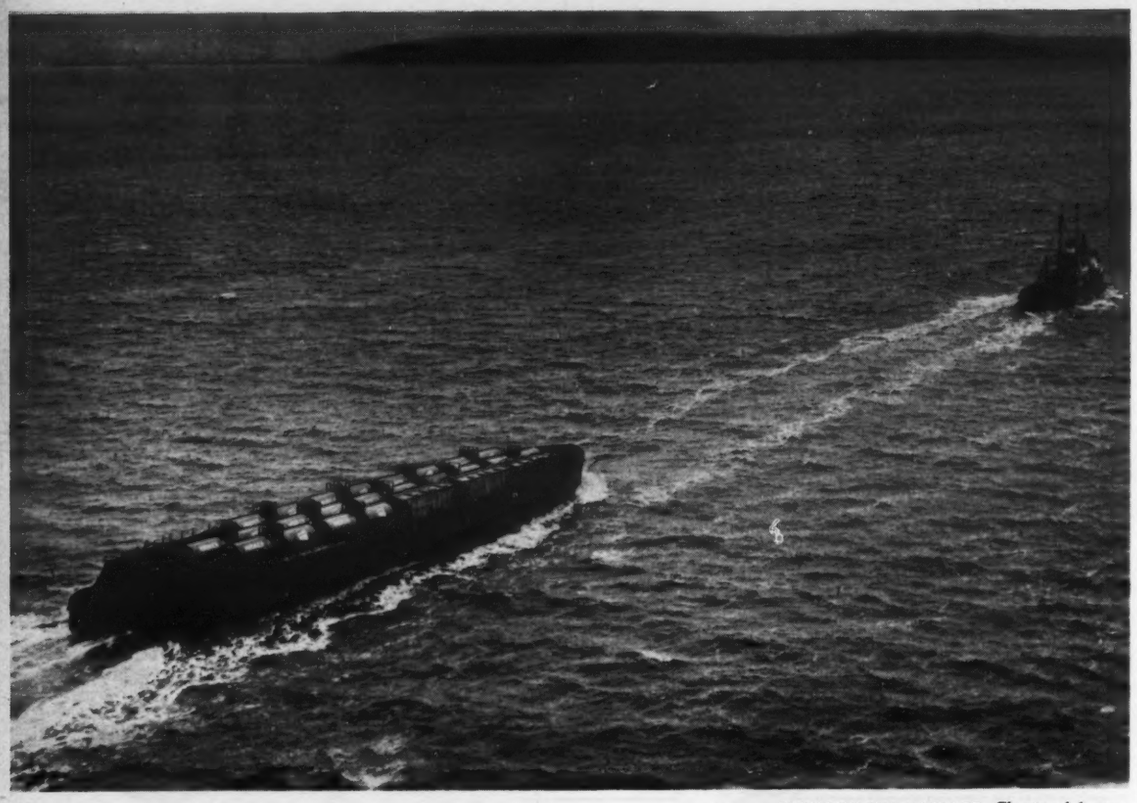


It's hard to realize that ¼ billion pounds of sodium are produced in the U. S. every year, putting it emphatically in the heavy chemical class. This enormous consumption is not apparent because so much is used *internally* by producers. U.S.I. sells more sodium than all other producers and continues to pioneer in sodium research as it pioneered SODIUM DISPERSIONS and HIGH SURFACE SODIUM COATED ON INERT SOLIDS.

USE OUR EXPERIENCE — SEE U.S.I. FOR HELP ON YOUR SODIUM REACTIONS.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

When inquiring check CP 7901 opposite last page



ECONOMY-SIZE PACKAGE. Chartered barge, one of a fleet used in Hooker West Coast service, carries 11 cars of liquid chlorine and other chemicals on deck. Below deck are carried, 1,000 tons of caustic soda. The barge is seen here in Elliott Bay off Seattle, en route to a pulp mill in British Columbia.

Could chemicals-by-barge save you $72,000 a year?

Tests may show that there's little brand difference in some of the heavy chemicals you buy. But there can be a real dollars-and-cents difference.

Often, *how you get them* makes that difference.

For example, a large midwestern processor had been buying 50% liquid caustic soda by tank car. At our recommendation this company decided to receive caustic by barge. The result: a $72,000-a-year saving.

If you can take caustic soda by water, why not look into barge delivery? All Hooker plants and caustic terminals, are located on deep water. There's a good chance that delivery by barge, specially chartered or Hooker-operated, can pile up real savings for you.

Call the nearest Hooker sales office or write us for more information on the dollars-and-cents difference the right method and volume of delivery can make for you.

SALES OFFICES:

NEW YORK ..... MUrray Hill 2-2500
CHICAGO ..... CEntral 6-1311
NIAGARA FALLS 6655
TACOMA ..... BRoadway 1215
LOS ANGELES ..... TErminal 4-2411
or NEvada 6-3826



MIDWEST CUSTOMERS near Great Lakes get rapid service from Montague, Mich., or from Chicago. Two men can unload a 300-ton shipment of caustic soda from this specially-built Hooker barge in one fast, smooth operation.

9-973

HOOKER CHEMICALS

1905—Half a Century of Chemicals
From the Salt of the Earth—1955

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When inquiring check CP 7902 opposite last page

Screen, roller printers will find that soluble green IB paste has improved quality

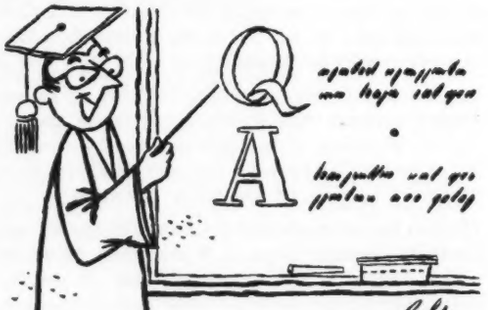
Improved quality Ahcovat Soluble Green IB Paste dyestuff shows excellent rate of fixation, has good working and fastness properties, and will be a definite boon to both screen and roller printers who prefer a paste-type product.

(Green IB Paste is a product of Arnold, Hoffman & Co., Inc., Dept. CP Canal & Waterman Sts., Providence, R.I. . . . or for more information check CP 7903 on handy form opposite last page.)

DIOP approved for use in non-toxic vinyl formulations

Di-iso-octyl phthalate has been shown by comparative studies to have toxicity and leachability parallel to that of the already accepted di-2-ethylhexylphthalate. Thus the substitution of one for the other or their use in combination has the approval of the Food and Drug Administration. This should be of interest to manufacturers of plastic food wraps who can now use this low-cost primary plasticizer.

(DIOP is a product of Plasticizer Div., Pittsburgh Coke & Chemical Co, 1970 Grant Bldg., Pittsburgh 19, Pa. . . . or for more information check CP 7904 on handy form opposite last page.)



Question — How can I find, quickly, stories about specific chemical materials appearing in this issue?

Answer — Check the alphabetical Product Directory (starting on page 185). It's a handy page reference to all articles and advertisements.

Absence of any odor makes antiskinning agent ideal for odorless paints . . .

chemical reactivity is neutral

Uses: In odorless paints, as an anti-skinning agent.

Features: Odor is so mild that it cannot be detected in finished paint. Required skin resistance is provided with minimum effect on drying. Chemical nature is such that no reactivity in can or film can be expected.

Description: Exkin No. 3 is crystalline in form, may be incorporated in paint by sprinkling weighed amount into batch during agitation. Sp gr (80°F) is 1.074. MP is 87-88°C. There is no residue when it is dissolved in recommended solvents. From 1 to 4 pounds will protect 100 gal of paint.

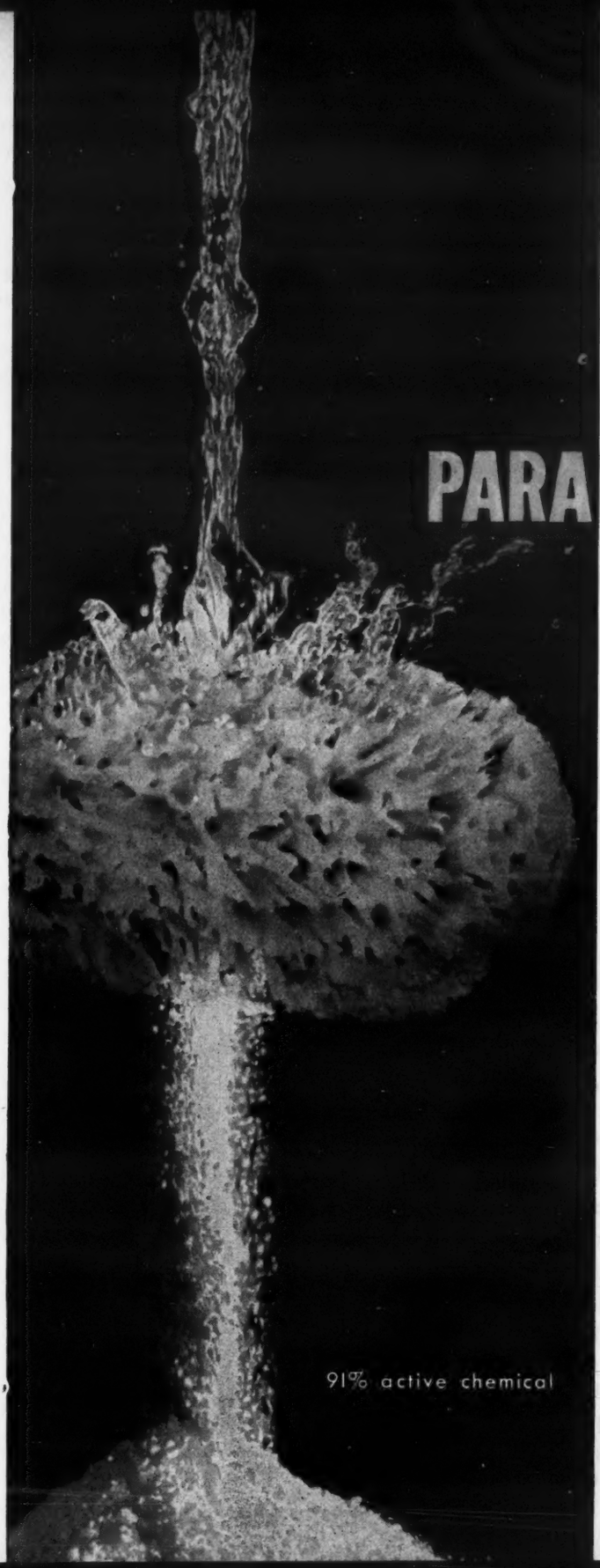
(Antiskinning agent for odorless paints is a product of Nuodex Products Co., Inc., Div. of Heyden Chemical Corp., Dept. CP, 1 Virginia St., Newark, N. J. . . . or check CP 7905 opposite last page.)

Cold casting compound formulations

Several trial formulations and properties of cold casting compounds based on liquid polymer LP-2 are covered in four-page bulletin. Cured elastomers display outstanding oil and solvent resistance, excellent low temp properties, and good resistance to aging and weathering.

Bul 115 on Thiokol liquid polymer compounds is issued by Thiokol Chemical Corp., Dept. CP, 780 N. Clinton Ave., Trenton 7, N. J. When inquiring specify CP 7906 opp. last page.

For more information on product at right, specify CP 7907 . . . see information request blank opposite last page.



formaldehyde isn't "formaldehyde" any more . . .

For high solids resins it's Celanese**

PARAFORMALDEHYDE

Produce more with your present equipment . . .

- **30% larger batches—water bulk eliminated**
- **⅓ shorter cycles—reflux and dehydration steps cut by hours**
- **greater reactivity, higher yields—lower formaldehyde-to-phenol ratio**

Get your Celanese representative to show you how this shortcut to lower costs and greater resin production can fit your operation. Or write for Technical Bulletin N-30.

Celanese Corporation of America, Chemical Division, Dept. 591-G, 180 Madison Avenue, N. Y. 16.

PLANNING ADDITIONAL INSTALLATION?

You can reduce capital investment by using Celanese Paraformaldehyde. No need for heated storage tanks or large storage area. Same output from smaller kettles; lower steam, electricity and cooling costs.

Celanese® CHEMICALS

*Reg. U. S. Pat. Off.

ONLY CELANESE OFFERS THE RIGHT FORMALDEHYDE FOR EVERY PURPOSE . . .
PARAFORMALDEHYDE • FORMCEL* SOLUTIONS
FORMALIN • TRIOXANE

Facts You Should Know About National Aniline's Commercial Production of Tolylene Di-isocyanates

National NACCONATES*

These simple facts are important to every present and potential user of di-isocyanates:

National Aniline through Allied Chemical resources is basic in every essential raw material needed for the manufacture of di-isocyanates . . . hydrocarbons, nitric and sulphuric acids, hydrogen, chlorine, carbon monoxide, alkalis, aromatic solvents, etc. To our knowledge, no other producer enjoys this advantage.

National Aniline and Allied Chemical experience in phosgene and diamine production spans over 35 years. To our knowledge, no comparable experience exists on the American continent.

We now have commercial-quantity production of Nacconate 80: can furnish other Nacconates for commercial development work (See list below). Additional mass-production plant facilities are now under construction.

Now available for immediate delivery in commercial quantities from Buffalo, N. Y., subject to prior sale:

National NACCONATE 80 Isomeric mixture of 80% 2, 4-tolylene di-isocyanate and 20% 2, 6-tolylene di-isocyanate

Also available for commercial development work:

National NACCONATE 65 Isomeric mixture of 65% 2, 4-tolylene di-isocyanate and 35% 2, 6-tolylene di-isocyanate

National NACCONATE 100 2, 4-tolylene di-isocyanate

National NACCONATE 200 3, 3′ bitolylene 4, 4′-di-isocyanate

National NACCONATE 300 Diphenylmethane 4, 4′-di-isocyanate

We invite inquiries for samples, technical data and quotations.

Watch the editorial and advertising pages of this publication for additional information on National NACCONATES

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Allied Chemical

Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

*TRADE MARK

Fluosilicic acid standards

Specs, safety precautions, sampling, inspection, packing, marking, and testing procedures on fluosilicic acid are presented in five-page digest-size booklet B703, priced at 20c, from American Water Works Assn., Dept. CP, 521 Fifth Ave., New York 17, N.Y.

Low specific viscosity provided by PVC

Polyvinyl chloride resin is announced with a low specific viscosity and correspondingly low mw. Resin can be processed at temperatures from 315 to 330°F into sheeting and film, non-electrical extrusions, and molded products.

(PVC-45 is product of Diamond Alkali Co., Plastics Div., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio. Check CP 7908 opposite last page.)

Glycol-ethers for solvents

Nine glycol-ethers, powerful solvents with mild odors, are covered in 40-page booklet. Some are completely water-soluble and are solvents for many dyestuffs, oils, waxes, and resins. They are used as mutual solvents or coupling agents, components of hydraulic fluids, and intermediates for plasticizers. Graphs, tables, and illustrations accompany text.

"Cellosolve and Carbitol Solvents" is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 7909 opposite last page.

For more information on product at left, specify CP 7910 . . . see information request blank opposite last page.

Low shrinkage in cure, good physical, electrical properties found in resin

solid prepolymer of diallyl phthalate can be used for laminates, molding

Uses: Resin is particularly valuable in making glass fiber laminates both for structural and electrical applications. Laminates can also be made from other woven textiles or paper. It also finds ready application in molding compositions and resin blends for high-resistivity electrical uses.

Features: In each of these fields, the properties of low shrinkage, absence of volatiles, and excellent physical, electrical properties are of advantage.

Resin acts as a cross-linking agent with unsaturated polyesters, and may be incorporated into the polyester at time of manufacture or added on the job.

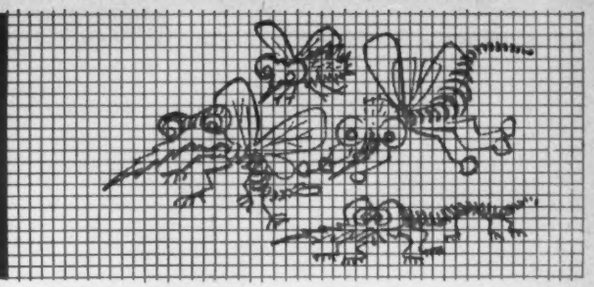
Description: Dapon is a solid prepolymer of diallyl phthalate. It is free-flowing, white powder which is thermoplastic and soluble in low-mw ketones, benzene, chloroform, ethyl acetate. It is insoluble in alcohols, water, and petroleum solvents. If a peroxide catalyst is added, resin thermosets under heat, mild pressure to an insoluble product.

Molding compounds are made by blending filler, fiber, lubricant, resin and a small amount of catalyst, and can be cured above 300°F. Through dipping or horizontal spreading, a uniform amount of resin can be applied to fabric. Surface may be soft and tacky, or dry and non-tacky, by adjusting ratio of monomer to resin. Typical properties:

Uncured	
Sp gr @ 25°C	1.259
Bulk density (lb/cu ft)	20
Shrinkage on curing (%)	0-1
Iodine number	55
Softening range (°C)	80-105
Cured	
Sp gr (@ 25°C)	1.27
Hardness (Rockwell M)	114-116
Impact resistance (Izod notched, ft-lb/in)	0.2-0.3
Heat distortion temp (°C, 10 mils def. @ 264 psi)	155
Compressive strength (psi)	22-24,000
Water absorption (% after 24 hr @ 25°C)	0.0-0.2
Refractive index (n_D^{25})	1.571
Dielectric constant (60 to 10^6 cy)	3.9-3.5
Volume resistivity (ohm-cm @ 25°C)	9.7×10^{15}
Dielectric strength (vpm @ 25°C, step-by-step)	450
Power factor (% @ 25°C, 60 cy)	0.7
Arc resistance (seconds)	118

(Diallyl phthalate resin is a product of Ohio-Apex Div., Food Machinery & Chemical Corp., Dept. CP, Nitro, W.Va. . . . or for more information check CP 7911 on handy form opposite last page.)

STOP SPOILAGE BY MOLDS AND BACTERIA...



Heyden PARASEPTS®
(ESTERS OF PARAHYDROXYBENZOIC ACID)

IN POLISHES, WAXES, PASTES, GUMS..



IN PHARMACEUTICALS..



IN TOILETRIES..



If your product is among the many that are subject to mold and bacterial attack, it will pay you to investigate the Parasepts as preservatives. These colorless and practically odorless neutral esters combine the properties of effectiveness, stability and safety, and have long served in a wide variety of products.

Our sales and technical staffs will be glad to discuss your prospective use. Write or phone the nearest sales office for full information and samples.

•

METHYL PARASEPT Purified (Methylparaben U.S.P.)
PROPYL PARASEPT Purified (Propylparaben U.S.P.)
ETHYL PARASEPT Purified
BUTYL PARASEPT Purified
BENZYL PARASEPT Purified

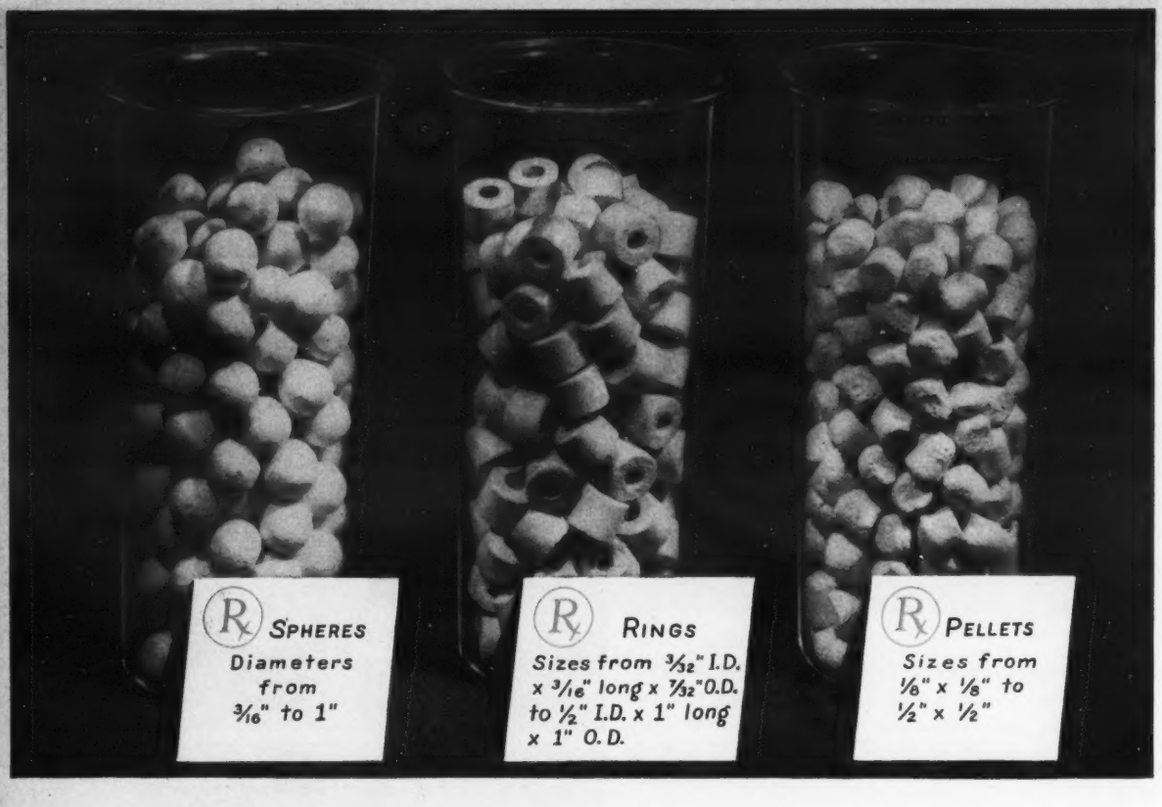
Technical grades also available for industrial applications. 100, 50, 25 lb. fiber drums.

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When inquiring check CP 7912 opposite last page



What are your catalyst carrier applications?

Norton engineered and prescribed carriers offer you important processing advantages

What do you need? An inert, high alumina carrier for fixed bed oxidation reactions — such as those involved in the manufacture of phthalic anhydride, maleic anhydride and ethylene oxide?

An inert, low density carrier for use as a space filler or tower packing?

Norton ALUNDUM* fused alpha alumina carriers are proving highly successful in such processes. Containing 77% to 89% alumina, they are outstanding for chemical stability and resistance to abrasion and erosion — and their low density is a valuable quality in packing and filling applications.

ALUNDUM carriers are commercially available in the form of spheres, rings and pellets. Also available in experimental quantities are carriers made of MAGNORITE*, CRYSTOLON*, Fused Stabilized Zirconia and Kyanite materials.

ALUNDUM Spherical Carriers

provide uniform beds in catalytic converters, reducing channeling and pressure drop to a minimum. Medium porosity spheres (40%-44%) have a network of open pores on the outside surface only. These are specifically recommended for applications where the carrier is coated with a catalyst. High porosity spheres (45%-49%) have an internal as well as external network of pores, and are suitable for applications where the carrier is impregnated with a catalyst.

Other Norton Refractories

for chemical processing include porous mediums, laboratory ware, ALUNDUM, MAGNORITE, CRYSTOLON, and Fused Stabilized Zirconia shapes. All are *engineered and prescribed* to give you the best possible ℞ — the most effective combination of physical characteristics plus thermal, chemical and electrical properties. For details call in your Norton Refractories Engineer, or write, mentioning your specific requirements to NORTON COMPANY, 566 New Bond St., Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto. Canada.

NORTON
REFRACTORIES
Engineered... ℞ ...Prescribed

Making better products... to make your products better

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

When inquiring check CP 7913 opposite last page

Gives superior bleaching action to alkaline peroxide solutions for cellulosic materials . . .

eliminates serious dyeing difficulties, provides savings in time and rinsing water

Uses: As a stabilizer in alkaline peroxide solutions for bleaching cellulosic materials.

Features: Agent gives superior bleaching action, eliminating serious dyeing difficulties and providing substantial savings in time and rinsing water. It is effective in combination bleaching with chlorine and peroxide, and leaves no insoluble residues. Finished work retains natural softness.

Description: Sunolox is a water-soluble, dry inorganic material. About 0.5-1.5 lb/100 gal water are used. This must be in solution before silicate is added. It is harmless to skin, non-corrosive.

(Bleach stabilizer is a product of Pennsylvania Salt Mfg. Co., Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. . . . or for more information check CP 7914 on handy form opposite last page.)

Effectively gels most non-solvents, exhibits temperature stability . . .

thixotropic bodying agent is also an accepted additive in coatings, inks

Although this agent has gained acceptance in surface coating industry as an additive to improve brushability, control sag, and aid pigment suspension, recent investigations have been concerned with its effect on non-solvent materials.

With the exception of water and glycerine, agent will effectively gel most non-solvent materials, including castor and linseed oils, mineral oils, dioctyl phthalate, polyalkylene glycol, and 100%-solids liquid resins. A 1% amount will generally produce a slight viscosity increase together with thixotropic properties, while 5% gives grease-like consistencies.

Temperature stability on aging is generally excellent. It's best with non-polar materials and in presence of inert pigments and fillers. Addition of inorganic gelling agents increases temperature range over which thixotropy is retained.

Material is modified 12-hydroxystearin. It is a non-toxic, waxy, finely-divided white powder, and is insoluble in water and standard organics. Properties:

Acid value	2
Iodine value	4
Saponification value	180
Fineness (% through No. 325 screen)	96
Bulk density (gm/cc)	0.25

(Thixcin is a product of The Baker Castor Oil Co., Dept. CP, 120 Broadway, New York 5, N.Y. . . . or check CP 7915 opposite last page.)

End-product performance of oleic acids

Comprehensive 20-page booklet covers various means of evaluating oleic acids, and emphasizes end-product performance as indicated by evaluation of various characteristic properties. Specs and composition of line of oleic acids are presented, and special features are pointed out.

Recommendations for best acid for specific end-uses are given in tabular form. Five charts cover viscosity, sp gr, and saponification characteristics. A correlation of color units is given.

"Emersol Oleic Acids" is issued by Dept. 5, Emery Industries, Inc., Dept. CP, Carew Tower, Cincinnati 2, Ohio. When inquiring specify CP 7916 on handy form which is located opposite last page.

Prevents odor and color reversion in alkyl aryl sulfonates, waxes, and fatty acids

Uses: As an antioxidant in alkyl aryl sulfonates, paraffin waxes, and fatty acids and derivatives.

Features: Product prevents odor and color reversion, inhibits rancidity and oxidation.

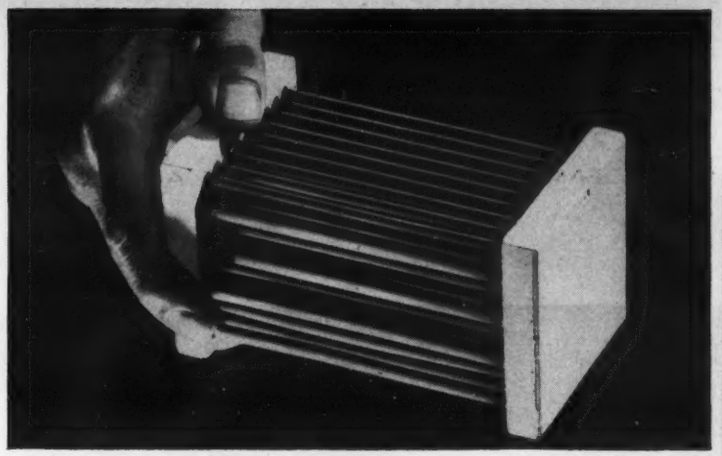
Description: Antioxidant is a white to buff-colored crystalline bis-phenol which is soluble in organics, insoluble in water. Preliminary studies show it to be non-toxic.

(Compound 19 antioxidant is a product of Sindar Corp., Dept. CP, 330 W. 42nd St., New York 36, N.Y. . . . or for more information check CP 7917 on handy form which is located opposite last page.)

Report on resin dispersions in emulsion paints

Dresinol resin dispersions, based upon rosin and modified rosins, are particularly useful in improving adhesion and increasing moisture resistance of water-based coating compositions. Twelve-page report covers work done and results obtained when Dresinol was used to modify latex paints by direct replacement of polymers.

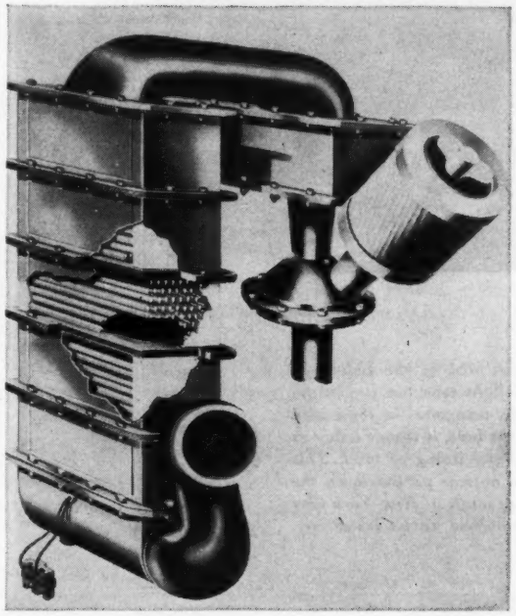
"Preliminary Report on Use of Dresinol in Emulsion Paints" is issued by Paper Makers Chemical Dept., Hercules Powder Co., Inc., Dept. CP, Wilmington 99, Del. . . . or for more information reader may simply check CP 7918 on handy form opposite last page.



This new combustion catalyst, the oxycat, controls air pollution and creates energy and power by recovering waste heat. Porcelain rods (by Frenchtown Porcelain Company, Frenchtown, N.J.) are largely made of ALCOA Alumina to provide high resistance to thermal and mechanical shock. Rods are coated with a catalytic agent of ALCOA Activated Alumina and platinum.



In typical installations, oxycats are mounted in exhaust stacks of furnaces, drying ovens, incinerators, or any industrial processes where combustible gases are exhausted. Waste gases flow across rods. Combustion occurs at catalytic surface. Heat released by this exothermic reaction can be returned to the oven, converted to steam or used in other processes. Catalyst removes practically 100% of pollutants from gas streams.



Oxy-Catalyst catalytic exhaust, working on the same principle, ends dangerous exhaust fumes and odors from internal combustion engines. Made to take the place of standard mufflers, OCM is easily installed in gasoline, diesel or LPG-powered equipment.

Now

ALCOA ALUMINA

turns exhaust gases into energy instead of smog

Oxy-Catalyst, Inc. of Wayne, Pa., has put ALCOA Alumina to work eliminating air pollution and inefficient combustion, all in one operation.

In their new oxycat and OCM exhausts, ALCOA Alumina is part of the porcelain rods and catalytic coating. Used in the porcelain because it is highly inert and chemically stable, ALCOA Alumina does not interfere with the chemical reaction of the catalyst. In the coating, ALCOA® Activated Alumina provides extremely active oxidation maintained over a wide range of temperatures. It is very resistant to poisoning and highly efficient over a long period of time.

ALCOA Aluminas are remarkably versatile wherever they are used . . . with hundreds of applications in catalysis, desiccation, refractories and ceramics. Put ALCOA Aluminas to work *for you.* Write for samples of alumina to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-G Alcoa Building, Mellon Square, Pittsburgh 19, Pennsylvania.

ALCOA CHEMICALS
ALUMINUM COMPANY OF AMERICA

When inquiring check CP 7919 opposite last page

FAMOUS LIGHTHOUSES OF AMERICA



SANDY HOOK LIGHTHOUSE, built in 1764 by the Colony of New York, is the oldest original light tower in use in the United States. A massive structure, octagonal in form with walls of stone seven feet thick at the base, it stands today as it was built except for an added inner lining of brick. This famous lighthouse is located on a narrow peninsula on the New Jersey coast sixteen miles due south of New York City and still helps to guide ships into New York's lower bay.

Sure guidance for users of electrochemicals is the long-recognized quality of Niagara Alkali products. A pioneer in this field, Niagara has helped manufacturers improve their products and the efficiency of their processes through the use of Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, N. Y.

MATERIALS

Offers low-Na chemicals for pharmaceuticals . . .

sodium content held 0.01% maximum

Sodium content has been held to 0.01% or less in a line of chemicals now available to the pharmaceutical industry. USP chemicals included are: NH_4Cl gran., $CaCO_3$ ppt., Ca gluconate powd., KCl gran. and powd., K_2CO_3 anh., and $CaCl_2$ gran. Ammonium salicylate NF and $CaCl_2$ anh. are also in the line.

(Low-sodium chemicals are products of Mallinckrodt Chemical Works, Dept. CP, 2nd and Mallinckrodt Sts., St. Louis 7, Mo. . . . or for more information check CP 7920 on handy form opposite last page.)

Melts 20-30°F higher than conventional polyethylenes . . .

resin provides greater rigidity

Uses: For making toys and large molded or vacuum-formed products.

Features: Has a softening point 20-30°F higher than conventional polyethylene resins; provides greater rigidity.

Description: Polyethylene resin has MP about 240°F. It is produced under conditions that approximate atmospheric pressure and temp. Experimental quantities are available.

(Higher-melting polyethylene resin is a product of Bakelite Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . or for more information reader may simply check CP 7921 on handy form which is located opposite last page.)

For more information on product at left, specify CP 7922 . . . see information request blank opposite last page.

Low volatility, fast high-temp cure suits rigid polyester resin for use in premixes . . .

resin cures at temperatures between 200-300°F

Uses: Polyester is suitable for a wide variety of press mold and potting applications. It can be used for hand layup applications which must cure at room temp.

Features: Low volatility and fast high-temp cure makes it well suited for use in premix compounds. It cures at 200-300°F, cure rate is rapid. Exotherm peak is moderate and pot life is good. Viscosity can be adjusted with vinyl toluene without materially affecting physical strength.

Description: Polyester resin has these properties:

Viscosity (cps)	8000-11,000
Sp gr	1.147
Heat distortion point (°C)	85
Hardness (Barcol)	50-55

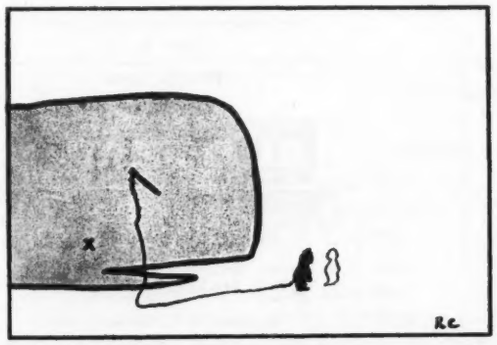
Monomer is nominally 30% vinyl toluene. Resin responds normally to usual catalysts.

(IC-671 Polyester is a product of Finishes Div., Interchemical Corp., Dept. CP, PO Box 659, Newark 1, N.J. Check CP 7923 opposite last page.)

Properties, compounding, and uses of vinyl resin for plastisols

Technical data on properties, compounding, and application of stir-in vinyl resin for plastisols are contained in 22-page report. Four full-page graphs show viscosity effects with primary plasticizers. Also covered are secondary plasticizers, fillers, pigments, stabilizers, surface-active agents.

"Formulating Quality Plastisols with Opalon 410" is issued by Plastics Div., Monsanto Chemical Co., Dept. CP, Springfield 2, Mass. When inquiring specify CP 7924 opposite last page.



"Sorry, Nanuk, we've plenty of sperm oil on hand."

ADVANTAGES FOR ALKYDS . . . WITH Glycerine

500°F

EASIER COOKING . . . whatever the temperature

420°F

Years of actual plant experience have demonstrated that Glycerine makes cooking of alkyd resins easier. Danger of gelling in the kettle is greatly reduced—which helps prevent costly tie-ups of men and equipment. Cooking can be carried on without complications over a wider range of temperatures.

And Glycerine has other important advantages in making alkyds, too:

- Its low MW/Hydroxyl ratio makes a wide range of resin properties economically feasible.
- Its chemistry has been thoroughly evaluated. Methods are perfected and literature abundant.
- Its liquid state simplifies handling problems. There are no bags to lift, no fines.

As year after year proves . . . *nothing takes the place of Glycerine.*

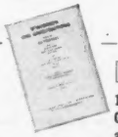
This balanced group of properties keeps Glycerine's usefulness growing

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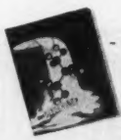
☑ CHECK AND SEND FOR TECHNICAL DATA



☐ 20-page booklet, "Glycerine Alkyds Tailored to Need"



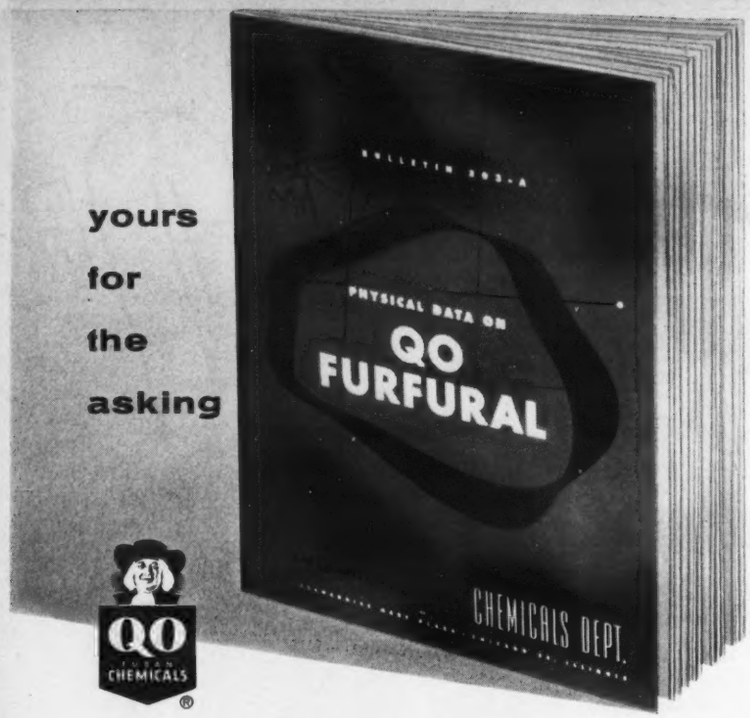
☐ 12-page booklet on Glycerine standards and specifications



☐ 16-page booklet on Glycerine properties and applications

For your free copy of any or all of these booklets write: GLYCERINE PRODUCERS' ASSOCIATION • 295 Madison Ave., New York 17, N. Y.

When inquiring check CP 7925 opposite last page



NEW QO®

Furfural Bulletin 203-A

Physical Data on QO Furfural

This bulletin—just published—presents graphs and tables of properties of QO Furfural. Methods for the recovery of furfural for re-use in chemical processes are described.

To help you evaluate QO furfural's wide range of versatile applications, write for your copy of 203-A.

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SALES REPRESENTATIVES IN MOST PRINCIPAL COUNTRIES

When inquiring check CP 7926 opposite last page

Water-soluble high-boiling liquid is unusually selective in its hydrocarbon solubilities . . .

preliminary tests indicate it to be non-toxic

Uses: Among the potential uses is as an anti-freeze and as a hydraulic fluid. Compound is a selective solvent for use in petroleum refining, synthetic textiles, and paints. It is a solvent for C_2H_2.

Features: Water-soluble liquid dissolves many organic compounds and is unusually selective in its solubility characteristics for hydrocarbons. Preliminary tests show it non-toxic. It is high boiling, low freezing in water solution, has high flash point.

Description: Dimethyl sulfoxide, CH_3SOCH_3, is a clear, water-white, very hygroscopic and completely water-soluble liquid. It is odorless and relatively tasteless. Physical properties:

Melting point (°C)	18.45
Boiling point (°C @ 760 mm)	189
Sp gr (@ 20°C)	1.100
Refractive index (n_D^{21})	1.4787
Vapor pressure (mm)	
20°C	0.37
47.4°C	2.82
56.6°C	5.11
Viscosity (cps @ 27°C)	1.1
Heat of soln (cal/gm)	60
Flash point (°C, open cup)	95

(Dimethyl sulfoxide is in pilot plant production at Stepan Chemical Co., Dept. CP, 20 N. Wacker Dr., Chicago 6, Ill. . . . or for more information check CP 7927 on handy form opposite last page.)

Adds ten biochemicals

1-Anserine, N-β-alanyl-1-methylhistidine, $C_{10}H_{16}N_4O_3$. Mp: 238-239°C (dec.).

Atropic acid, α-phenylacrylic acid, $C_9H_8O_2$. Mp: 106-7°C. Bp: 267°C. Tabular crystals.

Boldine, 2,6-dihydroxy-3,5-dimethoxy aporphine, $C_{19}H_{21}NO_4$. Amorphous powder with mp of 161-163°C.

***d*-Catechin,** $C_{15}H_{14}O_6 \cdot 4H_2O$, melts at 96°C. Needles.

Corydaline, $C_{22}H_{27}NO_4$. Prisms. Mp: 135°C.

Diacetone galactose, $C_{12}H_{20}O_6$, boils at about 115°C at 0.13 mm.

2-Hydroxyfluorene, $C_{13}H_{10}O$. Leaflets or needles. Mp: 171°C.

1-Leucinol, 2-amino-4-methyl-1-pentanol, $C_6H_{15}NO$, boils at 73-74°C at 1.4 mm.

N-Methylpyrrole, C_5H_7N. Bp: 112-113°C.

Sphingosine sulfate, $(C_{18}H_{37}O_2N)_2H_2SO_4$.

(Biochemicals are products of Bios Laboratories, Inc., Dept. CP, 17 W. 60th St., New York 23, N. Y. Check CP 7928 opposite last page.)

EL DORADO
COCONUT OIL



FEATURE CONTROLLED CHEMICAL COMPOSITION

. . . so you get better and easier control during processing . . . plus a better, more uniform end product.

SPECIFY EL DORADO FOR

- PURITY
- SERVICE
- UNIFORMITY

El Dorado has specialized in coconut oil products for more than half a century. That's one big reason why you can depend on the performance of El Dorado products in your formulations.

FATTY ACIDS

CAPRYLIC	ELDHYCO *	CAPRIC
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METHYL ESTERS

CAPRYLATE		CAPRATE
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*T.M. Reg.

For samples and specifications, write Dept. P.

Rely on



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Main office:
P. O. Box 599, Oakland 4, Calif.
Plants:
Bayonne, N. J., Oakland, Calif.

When inquiring check CP 7929 opposite last page

Develops emulsions for tackifying and adhesive purposes

Emulsions developed primarily for modifying latex for use in adhesive formulations are:

Tackifier #11 has 66%-solids content, gives stable yet fast breaking formulas. Viscosity is 14,000 cps. Color: white.

Tackifier #66 is recommended for use where a film of very strong pressure-sensitive properties of short duration is required. Solids content is 48%. Color is also white.

Tackifier #40, tan in color, imparts good adhesion to most rubber dispersions, and helps develop a strong bond. It is 49% solids, of 4000 cps viscosity.

Tackifier #26 is very low priced, can be used with most latices as an extender imparting strong adhesive properties. 64% solids and 1000 cps.

Tackifier #80A, 62% solids, has quick aggressive grab, very strong bond. Used with both natural latex and GR-S. Color is white, with viscosity at 22,000 cps.

(Fedco Tackifiers are products of Federal Latex Corp., Dept. CP, 210 Wythe Ave., Brooklyn, N. Y. . . . or check CP 7930 opp. last page.)

Blue pigment for vinyls resists color changes

Phthalocyanine blue pigment resists color change both in masstone and tints in vinyl compounds subjected to processing temperatures for periods up to 60 minutes. Color uniformity between runs is assured. Code D-650 is a paste for use in vinyl film, sheeting, and coated fabrics. Code DR-1079 is a dry concentrate for use by extruders.

(Unchlorinated Phthalocyanine blue pigment is a product of Claremont Pigment Dispersion Corp., Dept. CP, 110 Wallabout St., Brooklyn 11, N.Y. Check CP 7931 opposite last page.)

CORROSION KEYS

Starting on page 74 is a second set of Corrosion Keys. These show corrosion properties of products used for protection at a glance.

Keys presented here deal with surface metals, metals, and plastics . . . more are coming in future issues of CHEMICAL PROCESSING.

NOW!

SOLVAY Potassium Carbonate

in 91-94% POWDERED FORM

- *for faster dissolving!*
- *for better compounding!*

- Powdered to mix better with other finely divided materials
- Faster dissolving
- 91-94% K_2CO_3
- Attractively priced
- Packed in 100-lb., 5-ply polyethylene-protected bags and 400-lb. lined barrels

NOW AVAILABLE–Solvay's high quality Potassium Carbonate is produced in powdered form to mix better with other fine materials. In addition, this new 91-94% product is priced most attractively.

Solvay Potassium Carbonate produced in the WORLD'S MOST MODERN Potassium Carbonate plant is your assurance of *dependable quality!*

INSPECTION SAMPLES will be sent to you without cost or obligation*. For samples or specific information about a particular use, fill out and mail coupon today.

*In Western Hemisphere Countries Only

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Methylene Chloride • Monochlorobenzene • Para-dichlorobenzene
Ortho-dichlorobenzene • Methyl Chloride

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Gentlemen: Please send me AT NO COST OR OBLIGATION*

☐ Test Samples of Solvay *powdered* Potassium Carbonate

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Company_____

Position_____

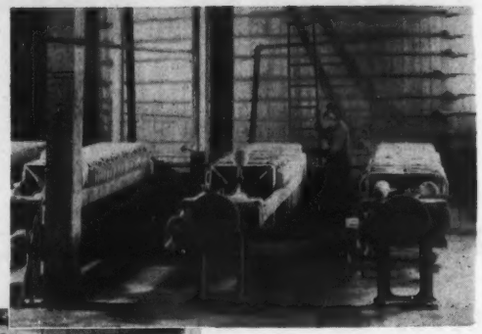
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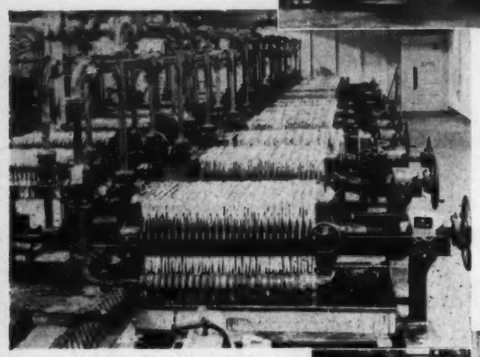
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When inquiring check CP 7932 opposite last page

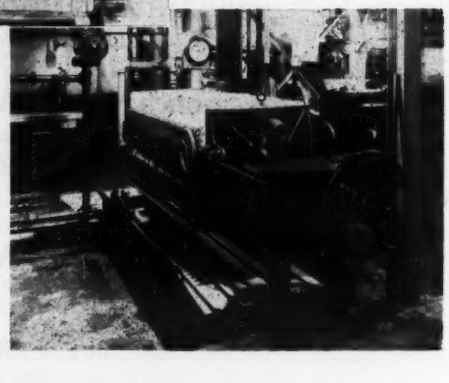
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that improve processing



Recovery of firm filter cake free of soluble salts as in this Shriver installation for colors and pigments. The presses are equipped with individual outlet cocks for controlling flow of wash water to individual filter chambers.



Filtration of viscous materials as in this battery of Shriver filter presses for rayon, which permit using inexpensive, throw-away filter medium, reducing operating costs.



Filtration requiring high degree of clarity, as in the purification of edible oils in this Shriver filter press, where filter paper or pads are conveniently used.



There are many other applications where Shriver filter presses help the problem of cutting operating costs or improving product quality. The new issue of the Shriver Book gives you plenty of information, suggestions and aids. Get a copy . . . free.

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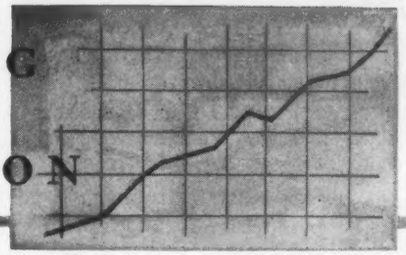
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When inquiring check CP 7933 opposite last page

EXPANDING CHEMICAL PRODUCTION



Isocyanate production by early 1956

Allied Chemical & Dye Corporation's new Moundsville, W. Va. plant should be operating at capacity by early 1956. Varied line of isocyanates, including di-isocyanates of toluene (TDI), di-tolyl (TODI) and diphenylmethane (MDI), will be produced at this location. These are now being turned out by Allied's National Aniline Division at Buffalo, N.Y.

Moundsville plant adjoins Solvay Process plant and will be integrated with it and other Allied Chemical plants.

Polyurethanes, made from isocyanates, will enter finished products in the fields of synthetic rubbers, resins, plastics, adhesives, surface coatings, and fibers.

World's largest sulfuric works now in operation

Largest single unit in the world for making sulfuric acid is now producing at DuPont's East Chicago Grasselli Chemical plant. Production of this contact plant is enough to fill a trainload every week. Supplying the Illinois-Indiana-Wisconsin area, acid will be used in making petroleum products, chemicals, insecticides, medicines, explosives, storage batteries, synthetic detergents.

Break ground for ammonia plant near Pensacola, Florida

Ground was broken recently for a $30,000,000 ammonia and nitrogen products plant near Pensacola, Fla. Ammonia, ammonium nitrate, and other nitrogen-bearing material produced at this plant by Escambia Bay Chemical Corp. will be sold exclusively through Ashcraft-Wilkinson Company.

Production of the plant, reported to be unique in its construction, should begin to be felt in early 1956. Florida, Georgia, South Mississippi, Alabama, and even part of South Carolina, will be served. Products include industrial chemicals.

Titanium tetrachloride by '56 at Natrium, West Virginia

Slated for partial production by April of 1956, Columbia-Southern's titanium tetrachloride plant is now under construction at Natrium, W. Va. Multi-million dollar facilities will be located near company's caustic-chlorine plant.

Celanese doubles Pampa capacity for vinyl acetate

Productive capacity of Pampa, Texas, vinyl acetate unit has been doubled by Celanese Corporation. Expansion was completed around June 1st. Facilities are also being installed at Pampa for production of methyl ethyl ketone.

New process at Mobile, Ala. for carbon bisulfide

Stauffer Chemical Company has announced newly developed process to be used for production of carbon bisulfide at Mobile, Ala. Construction of multi-million dollar plant is being started immediately for completion in spring of '56. Raw material position is a "natural", particularly for materials such as natural gas and sulfur.

News about chemical materials in the US – *plant construction, increased production . . . on stream now or planned for future*

Phenol plant completed by Hercules

Multi-million dollar plant at Gibbstown, N. J., is on stream, marking major step in Hercules Powder Company expansion and diversification program. Plant will produce annually 26 million lb of phenol, 16 million lb of acetone, as well as alpha-methylstyrene, acetophenone, and hydroperoxides. Cumene oxidation process will be used.

Plant is Eastern Seaboard's largest for production of synthetic phenol. Nearby oil refineries and steel mills will supply benzene and propylene. Hercules expects to expand plant further for production of phenols and oxychemicals now in development.

Double aniline production at Moundsville, W. Va.

National Aniline Division, Allied Chemical & Dye Corporation, will duplicate present plant at Moundsville, W. Va., for aniline oil. Same catalytic process will be used, requiring mixed acid, benzene, and hydrogen. Raw materials will be supplied by Allied Chemical family. Allied is also constructing major plant for isocyanates at Moundsville.

With new "poly" plant on stream, Spencer to expand Vicksburg

With its new polyethylene plant at Orange, Texas, on stream (capacity 45 million lb a year), Spencer Chemical Company is expanding nitric acid and ammonia production at Vicksburg, Miss. Expansion will cost $1½ million and be completed by spring, 1956.

Vicksburg plant now can convert only 60% of anhydrous ammonia produced into solutions. Capacity boost will allow conversion of all ammonia into solutions during peak demand seasons. Expansion includes additional solution storage facilities.

Thiokol doubles capacity for plasticizers

Expansion of Trenton, N. J., plant of Thiokol Chemical Corporation for production of low-temperature plasticizers has been completed. Capacity has been more than doubled with the new equipment, stainless steel to minimize color.

Goodrich spending $2½ million on synthetic rubber

Present capacity of Louisville, Ky., plant of B. F. Goodrich Chemical Company will be more than doubled by $2½ million expansion of Hycar rubber facilities. Construction started about June 15th and should be completed early in 1956. New facilities will be adjacent to present plant. Expansion ties in with the $8½ million acrylonitrile plant being completed at Calvert City, Ky.

International Minerals building plant in Ontario

Construction of nepheline syenite plant has been started near Havelock, Ontario, by International Minerals and Chemical Corporation. Plant will cost $1 ½ million. International Minerals controls deposit of 30 million tons nepheline syenite there.

Polyethylene and ethylene plants for Gulf Coast

Phillips Chemical Company is beginning construction immediately of two plants near Pasadena, Texas. One plant will produce polyethylene, the other ethylene. The two plants and pipeline between them will represent a multi-million-dollar investment. Name of the polyethylene will be Marlex. The ethylene plant will produce 145 million lb annually.

check this list

if you have any of the following filtration problems:

- ☐ Lack of clarity
- ☐ Pollution and disposal of filter cake
- ☐ Need for "sparkle"
- ☐ Unstable pre-coat
- ☐ Uneconomical volume of clarified filtrate
- ☐ Loss of cake due to pressure drop
- ☐ "Bleeding" of filter aid
- ☐ Abrasion of pumps, valves, etc.
- ☐ Too much retention of filtrate in filter cake

SOLKA-FLOC as a filter aid can help you solve them.

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When inquiring check CP 7934 opposite last page



Downtime and the labor cost of replacing worn-out tubing made of common materials can be a great deal more expensive than the extra first cost of long-lasting stainless.

The tube failure pictured is a dramatic reminder of the indeterminate, and usually shorter, service life of tubing which may bear a smaller price tag, but whose *total* cost can be measured only after the ravages of time and corrosion have tested its durability.

For optimum strength, corrosion resistance and oxidation resistance, there's a stainless grade, size, heat treatment and finish best suited to your particular pressure and temperature requirements. Ask Mr. Tubes, your link to B&W, how to get more for your money with stainless. *Or write for Bulletin TB-356 CP.*

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TA-5038(P)

When inquiring check CP 7935 opposite last page

Corrosion Engineering *a full measure*



F. L. WHITNEY, JR.
President NACE

(*Continued from page 7*)

constructing process equipment properly cannot be neglected. Aside from the technical aspects of fabrication it is well to recall that procurement is often based on price. If bids obtained on a stainless steel autoclave including auxiliaries vary as much as 50-100%, it would not be unwise to question quality of fabrication.

In any event such possibilities may be avoided by the use of fabrication standards to be submitted with all requests for quotations along with the design and material specification standards. These standards should include a description of acceptable fabricating methods with the view concentrated toward maximum corrosion resistance. The specifications should delineate the acceptable methods of welding, type of weld rod to be used, heat-treatments and surface cleaning methods following heat-treatments. Such specifications should also include provisions for quality control, evaluation of welders and weldments, heat-treatments, including physical inspection and acceptance as a result of all these tests. The quality control aspect will not only assure good fabrication practices directed toward a satisfactory unit from a corrosion standpoint but is also a good business tool.

As an illustration, a company received a quotation to bid on a piece of equipment quoted in two ways: one with automatic welding and one with manual welding. They pointed out that the automatic welding was not only cheaper but would decrease the delivery time. In these days, with much attention paid to capital investment and continuity of production, the proposal to automatically weld was quite attractive. However, the corrosion engineer questioned the corrosion-resistance quality of the automatic welding.

As a result tests were made which showed the automatic welding was vastly inferior in corrosion resistance to manual welding and if employed would have resulted in a premature failure. The autoclave was manually welded; but the sequal to this story is that the company concerned made an extensive study of the automatic welding operation. Subsequently, the process was developed to the point where it was satisfactory. Thus, automatic welding is now an acceptable fabrication procedure for this alloy with savings in fabrication costs.

Here is evidence of full measure gained.

This month

CHEMICAL PROCESSING

spotlights

its regular section on

corrosion control

Cities Service protects plant with vinyl coatings 52

Polyethylene tape withstands chemicals at Dow 54

Glass-lined polymerizers assure product purity 58

Litho Chemical uses plastic pump for corrosives 60

Acids resisted by plastic pipe at Globe Chemical 62

Magnesium sacrificial anode increases protection 71

Corrosion Keys: Surface coatings 74

Glass shell & tube heat exchanger for corrosives 85

Fluorocarbon dispersions protect equipment 90

Combating valve stem corrosion — NACE tech. paper 100

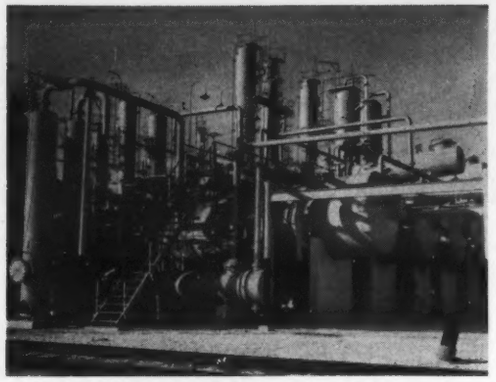
corrosion control

While former coatings lasted only a few months, vinyl system gives —

two years service in caustic and acid area

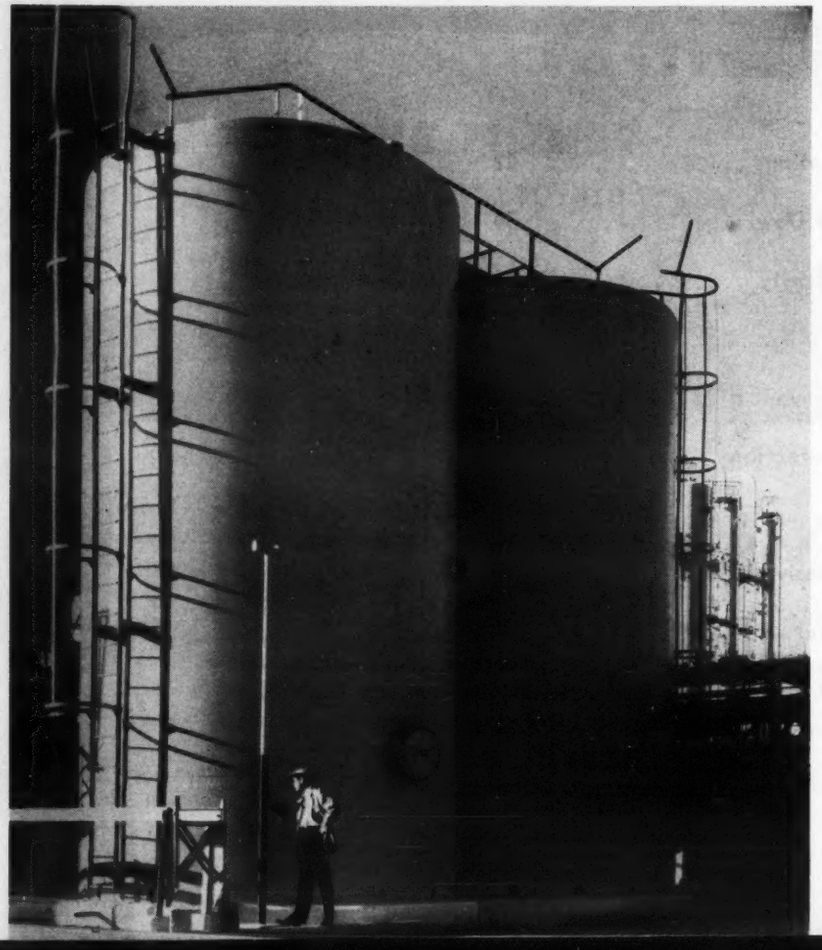
R. S. FREEMAN,
Tech. Ass't. to Chief Refinery Engr.
Cities Service Refining Corp., Lake Charles, La.
with **GORDON WEYERMULLER,** Associate Editor

PROBLEM: Corrosive conditions in chemical area of the Lake Charles Refinery of Cities Service caused paint to come off in a few months. Coatings on caustic storage tanks, lines, and lower portion of towers were subjected to corrosive liquids and fumes, presenting an extremely severe condition for any coating to overcome. A mixture of 50% caustic and methyl alcohol is handled with Unisol treating process used in the area. Internal temperatures in vessels are as high as 300°F. Temperatures on exterior of tanks are, of course, somewhat lower. Acid treating also takes place, with 85 to 93% sulfuric acid being used.



Section of chemical area in refinery which is subjected to caustic, acid, and solvent conditions

Corrosion engineer R. S. Freeman checks protective coating system which has solved a severe corrosion problem at Cities Service



Solution: In June of 1953 a coating system was applied in which vinyls were used for the top two coats in areas most subject to possible damage from corrosion. This system was applied in the chemical area to 15 vessels, the bottom portion of towers, low level piping, steel supports, heat exchangers, and drums.

Sandblasting could not be used for surface preparation since sand might damage bearings. Also, a possible spark from sand striking metal surface or static electricity formed by flow of sand would be hazardous in view of the hydrocarbons in the area. For this reason, surface was prepared by hand-cleaning with beryllium copper non-sparking tools.

Coating system used consisted of four coats applied in following order:

1—First an inhibitive primer of an alkyd formulation was used to obtain good wetting of the surface.

2—Next a chlorinated rubber coating pigmented with metallic lead was used. Primary function of this coating was to serve as a barrier between primer and strong solvents of vinyl coatings to follow.

3—Vinyl mastic was then applied to surface.

4—For sealing, No. 33 light gray vinyl coating was used. All coats were sprayed. Film thickness of the system was 1/16".

Results: Present coating system is still in excellent condition after nearly two years service in the corrosive area.

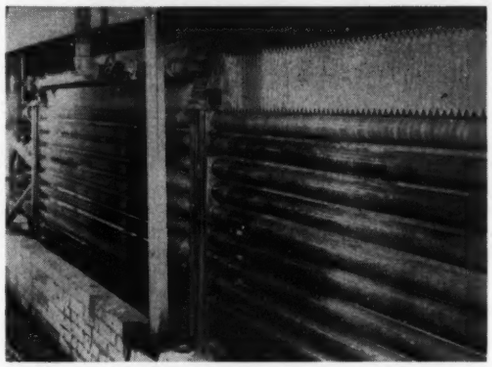
(Vinyl mastic and No. 33 vinyl coatings are products of Amercoat Corporation, div. of American Pipe & Construction Co., Dept. CP, 4809 Firestone Blvd., South Gate, Calif. Check CP 7936 opp. last page.)

Hot corrosives won't harm cooler made of graphite

economical, standard-design unit does an efficient job in open atmosphere

Uses: Cools corrosives at temperatures up to 700°F in the open atmosphere.

Features: Inlet tubing of cascade cooler, where corrosive enters at a high temperature, is made of carbon-impregnated graphite (Graph-I-Tite). It is capable of withstanding temperatures to 5700°F, under controlled conditions. Balance of cooler tubing, where temperatures are below 340°F, is made of resin-impregnated graphite (Impervite).



High-temperature cascade cooler in use at Michigan Chemical Corp., St. Louis, Michigan

Description: Cascade cooler, as shown in accompanying photo, is a series-flow vertical bank unit, with an adjustable water distributor. It is immune to the attack of practically all corrosives, possesses a high rate of thermal conductivity, and has extremely low thermal expansion (1/5th that of cast iron).

(Impervious graphite cascade cooler is a product of Falls Industries, Inc., Dept. CP, Aurora Rd., Solon, Ohio . . . or for more information check CP 7937 on handy form opposite last page.)

"Corrosion Keys" — easy-to-use data starts on page 74

√ Industry wipes out corrosion with Firestone Exon Resins

How does this acid-loaded truck STEER CLEAR OF CORROSION?

VYFLEX L-10* LINES THE TANKS!



Hydrofluosilicic acid is as hard to control as it is to pronounce. In Philadelphia, a Reader Bros. truck has to haul all of this highly corrosive acid the city needs for its water treatment. And in 6 months, it hasn't needed an hour's maintenance due to corrosion!

Reason: Reader Bros. Inc. had the tank, interior baffles, outlets and manholes lined with VYFLEX L-10 3/32" thick. Installation was quick, simple, and quite inexpensive. Maintenance costs—nil.

Installation by Goodall Rubber Co., Trenton, N. J.

VYFLEX L-10 LINING derives its immunity to corrosion from its base resin, Exon 900 series. These are only a part of the many Exon resins developed by Firestone engineers to help wipe out corrosion costs.

In plant after plant, lightweight structural rigid applications of unplasticized PVC are based on equally effective Exon resins.

The fact is, you *can* stop corrosion! Exon polyvinyl chloride resins provide a wide variety of versatile PVC materials to develop the answer to your specific corrosion problem.

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*Product of Kaykor Industries, Inc. Division of Kaye-Tex Mfg. Corp. Yardville, New Jersey

*Vyflex L-10 is made from Exon resins.

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corrosion control



Fig 1—Vertis Volkening, Group Leader in Chemical Engineering Dept. at Dow, pulls back a strip of polyethylene tape on hot caustic line, demonstrating that the tape still has good adhesion

Field tests at Dow Chemical Company show that polyethylene tape, placed in service in July 1952 and still in excellent condition —

withstands severe chemical exposures

Results suggest that tape can be satisfactorily used in a variety of applications in chemical plants to stop corrosion

Recent examination of field tests being conducted on polyethylene tape at Dow Chemical Company, Freeport, Texas, show that tape subjected to severe chemical exposures since July 1952, is still standing up well. These results demonstrate that the tape has a high degree of chemical resistance and can be used with confidence in chemical plants to control corrosion.

When tests were initiated, plan was to use the polyethylene tape in some typical chemical plant applications. Tape was placed in three of the most severe exposures in Dow's Texas Division. It was considered that if the tape were satisfactory in these highly corrosive areas, it certainly would be suitable for general use in chemical plants, many areas of which

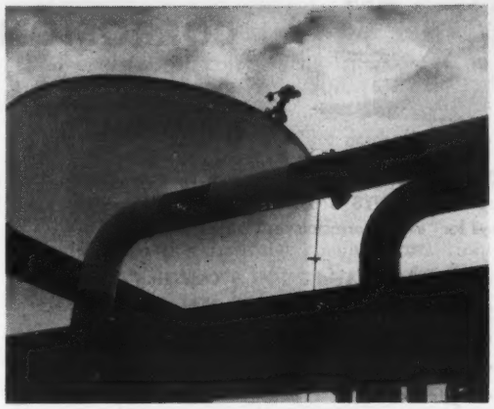


Fig 2—Black and gray polyethylene tape on this line is still in excellent condition after being subjected to continuous exposure to water vapor as well as possible chemical fumes since July 1952

would have less severe conditions.

Tape was first used for wrapping a 12" caustic line with a surface temperature of 165°F. So little experience had been had with polyethylene tape at this high a temperature, that it was thought that the condition might prove too severe. However, as shown in Fig 1, tape is still in good condition after 2½ years service. In photograph, Vertis Volkening, Group Leader in the Chemical Engineering Dept. at Dow, is shown pulling back a strip of tape to demonstrate that it still has good adhesion.

Second location in which the tape was placed in service was on an 8" line (Fig 2) in the carbon tetrachloride plant. This line is near some film coolers and is subjected to continuous water vapor as well as possible chemical fumes. As shown in

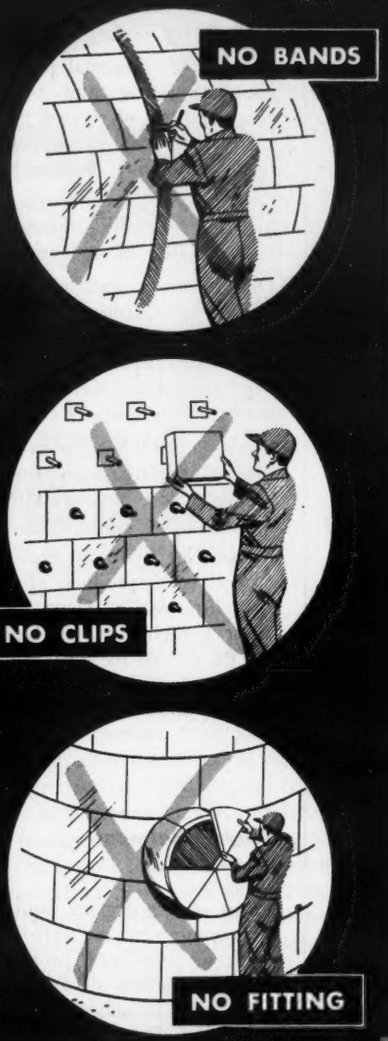
(*Continued on page* 57)



Fig 3—While coating on pipe in rear above brine treating tank has failed, black and gray polyethylene tape is still providing good protection to pipe in front after 2½ years service

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POLY-CELL, the Foam Insulation of individual tiny cell construction, is one of the most convenient forms of insulation ever developed.

It sprays like paint . . . it foams 20 times its original thickness . . . it can be installed without trouble anyplace where a spray gun can be pointed.

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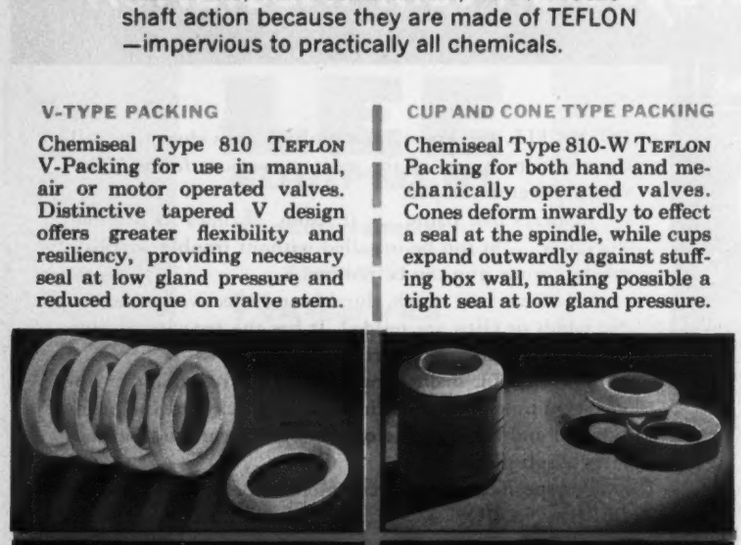
Get Chemiseal Packings that last months instead of hours. Packings that won't deteriorate, won't contaminate, won't "freeze" shaft action because they are made of TEFLON —impervious to practically all chemicals.

V-TYPE PACKING

Chemiseal Type 810 TEFLON V-Packing for use in manual, air or motor operated valves. Distinctive tapered V design offers greater flexibility and resiliency, providing necessary seal at low gland pressure and reduced torque on valve stem.

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Chemiseal Type 810-W TEFLON Packing for both hand and mechanically operated valves. Cones deform inwardly to effect a seal at the spindle, while cups expand outwardly against stuffing box wall, making possible a tight seal at low gland pressure.



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"Finger-print corrosion" on polished surfaces prevented . . .

coating neutralizes acids and forms protective film

Uses: Protecting highly-polished or super-finished surfaces from corrosion caused by lactic acid, urea, and sodium chloride residue of ordinary fingerprints.

Features: Material provides a rupture-resisting film to allow safe handling of treated parts. It is easily removed by solvent prior to applying final finishes.

Other advantages are non-toxity, high anti-humidity properties, and long stability in storage.

Description: Particularly effective on non-ferrous metals and bimetallic assemblies, material meets Government Spec MIL-C-15074A for "Compound Corrosion Preventive, Fingerprint Remover."

Material itself has a petroleum base containing fingerprint neutralizing and suppression additives, and rust inhibitors.

(Cosmoline 1070 fingerprint remover is a product of E. F. Houghton & Co., Dept. CP, 303 West Lehigh Ave., Philadelphia 33, Pa. . . . or for more information check CP 7942 on handy form opposite last page.)

Single treatment rust inhibitor

An ashless organic liquid that prevents rust and corrosion in clean petroleum products at concentrations of from 10 to 40 ppm is subject of 20-page booklet. Description, use, and effect of the "single treatment" inhibitor are presented.

"Santolene C Rust Inhibitor" is issued by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 12th & Delmar, St. Louis 4, Mo. When inquiring specify CP 7943 on handy form which is located opposite last page.



here's your answer **to SEVERE CORROSION PROBLEMS!**

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To help solve your severe corrosion problems . . . get this cost-cutting information on physical properties, corrosion resistance, tolerances and available sizes. Write today for your copy of this bulletin on Carpenter ALLOYS B and C to:

THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N. J.

When inquiring check CP 7944 opposite last page

Here's Corrosion Control!

CORROCOTE

a neoprene "paint"

Saved $9000 in replacement costs for one firm...has lasted 2½ years with no maintenance!

CORROCOTE #362 is a liquid neoprene that self-vulcanizes to form a tough, elastic, corrosion resistant chemical rubber coating up to 0.005" thick. It completely eliminated corrosion of drip pans of air conditioners and cooling towers for a Philadelphia firm. Management reports over $9,000 savings in replacement costs. Original application is 2½ years old: has had no maintenance. 4 or 5 more years of trouble-free service is expected. A "natural" for corrosion control, Corrocote has many applications throughout industry. Available in gray, black, aluminum and red. Send for details today.

(Inquiries from representatives invited.)

Chemical Coatings & Engineering Co.

BROOMALL 4, PA.

When inquiring check CP 7945 opposite last page

POLYETHYLENE TAPE

(*Continued from page* 55)

photograph, both gray and black tape were used.

Third field test of polyethylene tape was over a sodium chloride brine treating tank (Fig 3). Both black and gray tape are still providing good protection to the 2" pipe in front while paint system on pipe in rear has failed due to the severe exposure. Both the paint and the tape were placed in service in July 1952.

In addition to the particular chemical conditions resisted by polyethylene tape in each of the three locations, it has also had to withstand the year 'round exposure to salt air, high humidities and temperatures, which make this area one of the most corrosive in the world.

(No. 900 black and No. 910 gray polyethylene tape are products of Polyken Dept. of The Kendall Co., Dept. CP, 222 W. Adams St., Chicago 6, Ill. . . . or for more information reader may simply check CP 7946 on the convenient Reader Service slip which is located opposite last page.)

Unplasticized PVC laminated plate resists variety of corrosives in two-year tests

Physical properties of unplasticized Exon 402-A (PVC) laminated plate showed little change after exposure to a variety of chemicals at 73°F for *two years* in recent tests. Results of tests involving some of the corrosives are shown in following table. In heat distortion tests, the 10-mil deflection temperature at 66 psi maximum fiber stress is shown.

	Tensile strength in psi	Flex modulus of Elasticity in psi	Heat Distortion Temp °C
Warehse aged sheet	9300	510,000	74
Acetic acid, 10%	8100	500,000	73
Acetic acid, conc	8900	480,000	74
HCl, 10%	8600	490,000	74
HCl, conc	8600	500,000	73
Nitric acid, 10%	8700	490,000	74
Nitric acid, conc	8100	480,000	73
Sulfuric acid, 10%	8700	500,000	74
Sulfuric acid, conc	9200	510,000	75
Sodium hydroxide, 50%	8700	500,000	75
Carbon tet	8600	500,000	74
Diethylene glycol	9100	500,000	75
Methanol	7600	460,000	56
Ammonium nit, 10%	8600	480,000	74
Cupric chloride, 10%	8700	490,000	74
Ferric chloride, 10%	8700	490,000	74
Sodium nitrate	8700	480,000	75
Zinc chloride, 10%	8800	500,000	73

(Information courtesy of Firestone Plastics Co., Div. Firestone Tire & Rubber Co., Dept. CP, Pottstown, Pa. . . . or for more information reader may simply check CP 7947 on the convenient Reader Service slip which is located opposite last page.)



This nickel-clad steel tank processes essential oils, was designed to operate at 100 psi. pressure.

CLAD STEEL EQUIPMENT GIVES SOLID HIGH-ALLOY PROTECTION

AT LOWER COST

Where protection from corrosion, abrasion, and forms of product contamination such as metallic pick-up is a "must", clad steel equipment is often the *economical* answer. Under pressure, vacuum or thermal cyclical service, the high-alloy cladding will not tear away nor will bond failure permit liquid seepage between cladding and backing. If processes change, equipment modifications can be readily made without injuring the clad surface or bond. The smooth contours and joints possible with clad mean easy cleaning and low maintenance, too.

Why pay a premium for protection in your new processing equipment? Lukens Clad Steels—stainless, nickel, Monel, Inconel, copper—give you all the advantages of these solid high-alloys with savings up to 50% in material costs.

When you're thinking of new tanks and vessels, *qualified* equipment builders can assist from the earliest stages of planning. Working with your engineers and consultants, they know how to help minimize first cost and assure trouble-free equipment life with clad steel. We offer the widest range of clad steels available and work closely with fabricators to help select the type most suited to your processing needs. If you would like further information, ask one of your builders or write Manager, Marketing Service, Lukens Steel Company, 750 Lukens Building, Coatesville, Pennsylvania.

LUKENS CLAD STEELS

STAINLESS-CLAD · NICKEL-CLAD · INCONEL-CLAD · MONEL-CLAD

PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEEL PLATES AND HEADS AVAILABLE

When inquiring check CP 7948 opposite last page

Neither

VEGETABLE OILS

Nor

caustic solutions
can harm
VALDURA'S

VALPON

HERE is the *perfect* protective finish for equipment and floors in all processing plants and extraction plants burdened with maintenance problems occasioned by oils of any type and caustic cleaning solutions. Valpon, a product of Valdura research, incorporates the marvelous Epon Resins discovered by Shell Chemical. It is not only invulnerable to all types of oils and caustic solutions but even displays remarkable resistance to acids and alkalies. It has been proved in use by large food processors, refineries and extraction plants.



Available in suitable industrial colors and black and white.

If you'd like to know more about Valpon and other items in Valdura's complete line of specialized maintenance products, or if you'd like help with a particular problem, just state your wishes on your regular letterhead and mail to the address below. *Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!*

VALDURA PAINTS THAT ENDURE

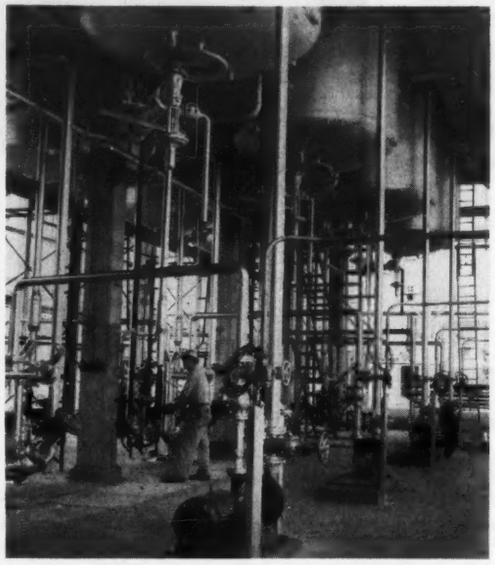
VALDURA HEAVY DUTY PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 7949 opposite last page

Polyvinyl chloride polymerizers assure product purity at General Tire . . .

glassed-steel vessels with heavy walls handle pressures from 200 psi to vacuum

Problem: Polymerizers at the recently-opened polyvinyl chloride plant of General Tire & Rubber Co., Ashtabula, Ohio, had to be designed so they could handle a corrosive chemical (HCl with PVC) at pressures ranging from 200 psi to full vacuum. Close temperature control was important — and difficult because the process is triggered with quick heating and then becomes highly exothermic.



Glassed-steel polymerizers in use at General Tire

Vigorous suspension-type agitation of the increasingly viscous, clinging material was required, even while a vessel was being emptied. No contamination of the product by lubricants, iron, or material from previous batches could be permitted.

Solution: Glassed-steel was chosen as construction material for vessels primarily because of its resistance to corrosion and because product does not adhere readily to glass. In designing the vessels, experimentation started with a 30-gal laboratory reactor and was further developed in a 300-gal pilot plant polymerizer. Ten units recently installed each have a capacity of 3500 gal, are 17 ft high, including the drive, and weigh over 11 tons empty. Plant produces about 25 million pounds of PVC per year.

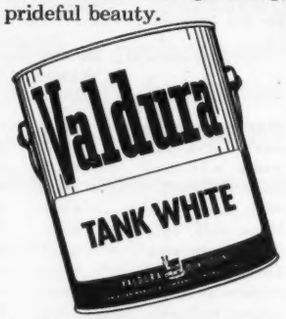
Wide variations in working pressures required, 200 psi to vacuum, made it necessary to make reactor walls thicker than usual for vessels of this type. Inner tank walls are 1-5/32" thick.

The **VALDURA** name stands for a complete line of specialized industrial maintenance products designed to serve every type of American industry. Typical products are indicated below Other Valdura Specifics and Exclusives will be identified in future ads. Watch for them! They can solve your toughest maintenance problems.



Val-Chem serves as the *perfect* primer for Valpon or any of the Valdura finishes incorporating chemical resistance. It provides speedier drying and a vastly superior bond.

Tank-White combines *maximum* resistance to weathering and industrial fumes, and an extra measure of gleaming, prideful beauty.



If you have a particular maintenance problem which is urgent just describe it on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!

VALDURA PAINTS THAT ENDURE

VALDURA
HEAVY DUTY
PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 7950 opposite last page

Fast heat transfer was secured by extending jacket partially around top head, down sidewalls, and around the bottom. Rapid rotation of heating or cooling water is obtained by injecting it through four agitator nozzles. Pumps circulate water through jacket at 350 gpm. Since lake water is used for cooling, jacket has removable top which permits easy mechanical cleaning if needed.

Temperature control is secured by varying ratio of water recirculated to that of fresh lake water utilized. Steam-water mixing tee is used for heating. Temperature control bulbs are located both in restricted tip glassed-steel baffle and in weir box used for water exit.

In order to prevent contamination, a corrosion-resistant dual rotary seal is used. Lubricant is placed in a chamber between the two seals at a pressure less than half that of the reactor. Tightness of seal is indicated by a pressure gage. Tests indicate that the seal is leakless under pressure or vacuum, either with agitator running or stopped, for long periods of operation.

A step bearing protects seals at top of reactor and reduces possibility of process upsets. The step bearing, mounted through bottom, consists of a replaceable alloy steel internal bearing pin with Teflon seal rings and nylon bushings which are continuously flushed with water.

Results: Laboratory tests show that since plant went on stream in Oct 1954, product processed in reactors has had a high purity, with an almost complete absence of iron, lubricants, or other contaminants.

Temperature cycle is being controlled within $\pm 1^{\circ}F$ as a result of the design. Method of agitation permits close control of particle size, of great importance in polymerizing polyvinyl chloride. Vessels have required a minimum of maintenance.

(Polymerizers were engineered and constructed by The Pfaudler Co., Dept. CP, 1000 West Ave., Rochester 3, N. Y. . . . or for more information check CP 7951 on handy form opposite last page.)

Combating corrosion with aluminum

How to design for maximum corrosion-resistance with wrapped aluminum is described in a two-page bulletin. Illustrations indicate how maximum corrosion-resistance can be obtained by proper design and construction. Topics include crevice-corrosion, galvanic corrosion, and stress corrosion.

"Designing with Aluminum" is issued by Kaiser Aluminum & Chemical Corp., Dept. CP, 1924 Broadway, Oakland 12, Calif. When inquiring specify CP 7952 on handy form which is located opposite last page.

14 years of Lake Michigan weather STILL NO CORROSION!

Metallized zinc provides complete protection for steel traffic lane curbs

One of the many things to be seen in Chicago, while driving on the outer drive along Lake Michigan, are unique retractable traffic lane curbs or "fins." Developed and installed by the Chicago Park District in 1940, they provide flexible allocation of roadway capacity on this multiple-lane highway.

Before installation fourteen years ago the steel curbing was grit-blasted and metallized with pure zinc .006" thick. According to Mr. A. J. Blaylock, foreman of the Chicago Park District, no further maintenance has been required, in spite of rain, snow, ice and many tons of salt used during the winter months. Mr. Blaylock further points out that "today the fins look as good as when they were metallized 14 years ago, and in my opinion they will last at least another 14 or 20 years without additional maintenance."



Outer drive along Lake Michigan shore showing steel curbing retracted in foreground.

Zinc metallizing section of retractable curbing back in 1940. Note mesh insert to reinforce concrete later poured in top slot of curbing.



Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without *any* further maintenance.

In the chemical field, metallized zinc and aluminum, used with special organic aftercoatings, have proved highly resistant to many corrosives—eliminate undesirable product contamination.

These unique metallic coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Now you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting. Write for descriptive Bulletin 93-X—it's free.

The following organizations are set up to provide positive corrosion protection at lower annual cost in accordance with Metco* System specifications. For further information or copy of descriptive bulletin write, wire or phone Metco Systems, address and phone number below. **Reg. U.S. Pat. Off.*

Metco System Contractors

Akron Sand Blast Co.
Arthur Tickle Engineering Works, Inc.
Clark Metallizing, Inc.
Dix Engineering Co., Inc.
F. W. Gartner Company
Gulf Engineering Company, Inc.
Metal-Cladding Inc.
M W Protective Coatings Div. of Metalweld, Inc.
St. Louis Metallizing Co.
The Southern Galvanizing Company

Metco Systems

10 Bridge Street, Westbury, Long Island, New York

Telephone: Edgewood 4-1308

METCO SYSTEMS
10 Bridge Street,
Westbury, Long Island, N. Y.

Please send me descriptive bulletin on the Metco Systems.

name _____

title _____

company _____

address _____

city _____ zone _____

state _____

When inquiring check CP 7953 opposite last page

Easy working and long life in chemical atmospheres ...for the Lapp Valve

Non-ferrous working parts in the Lapp Valve eliminate freeze-ups from scales of corrosion. Threaded stud, yoke bushing and nuts, and plug cap are all brass or bronze, which keep the valve smoothly operative in all but the most unusual conditions of chemical atmosphere. Flange, yoke and gland are of high strength malleable or ductile iron, and are protected with baked-on Epon-base acid-proof paint. Flanges are permanently bonded to porcelain or armor with acid-proof resin cement. *Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 431 Wendell Street, LeRoy, New York.*



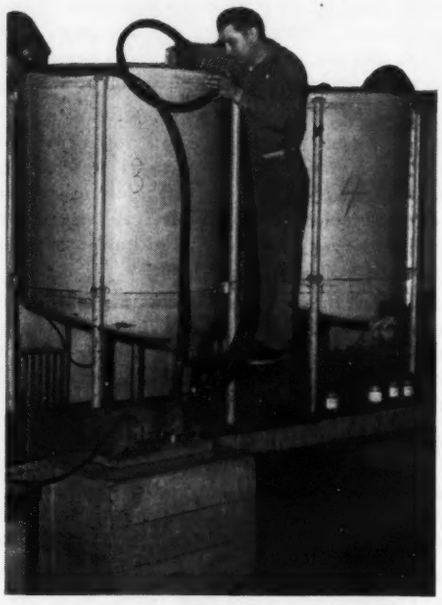
When inquiring check CP 7954 opposite last page

Five years service is provided by pump handling corrosives at Litho Chemical . . .

transfers hydrochloric, formic, lactic acid, and salt solutions

Problem: Former pumps used for transferring acids and salt solutions in the Etch Room of Litho Chemical & Supply Co., Lynbrook, L. I., N. Y., failed in a short time, with constant shaft seal maintenance required.

Solution: Approximately five years ago, plant started using a plastic pump designed without stuffing boxes or shaft seals of any sort. Pump handles hydrochloric, formic, lactic acid, zinc and calcium salt solutions. Unit operates five days per week, about two hours per day, to transfer decanted liquors between glass-lined steel tanks. Temperatures range from 100 to 180°F, with suction and pressure heads each as high as five feet. Maximum flow rate is five gpm.



Plastic pump in corrosive service at Litho Chemical

Pump has Bakelite body block and a Flex-i-liner made of Hycar ruber. Fluid passing through pump is never in contact with metal but passes across outer surface of flexible liner and surface of body block. Unit is activated by an eccentric rotor and shaft assembly which rides inside the flexible liner. Fluid which is trapped between liner and body block is progressively "squeezed" through pump. Unit is self-priming, has no gaskets or check valves.

Results: Pump has proved to be highly satisfactory in the corrosive service during the five years it has been in operation. No maintenance except

lubrication has been required. Because of the efficiency of the five gpm unit in service, company recently placed an order for a larger plastic pump with a flow rate of 20 gpm.

(Pump is product of Vanton Pump & Equipment Corp., div. of Cooper Alloy Corp., Dept. CP, 201 Sweetland Ave., Hillside, N. J. . . . or for more information check CP 7955 opposite last page.)

Comparative chemical-resistance of coatings

One of many interesting items in 27-page reprint from Organic Finishing Handbook is a table showing the comparative chemical-resistance of typical commercial coating formulations. Eleven coatings are graded according to their resistance to alkalis, acids, solvents, heat, and other conditions. Pamphlet also contains considerable information on synthetic resins and polymers. Another table lists outstanding properties and uses of some synthetic coatings.

Reprint on chemical-resistant coatings is available from Atlas Mineral Products Company, Dept. CP, 26 Walnut St., Mertztown, Pa. When inquiring specify CP 7956 opposite last page.



In a typical non-destructive, thickness-testing application this gage is being used to determine minimum wall thickness of high-pressure gas cylinder. Cylinder is mechanically rotated while transducer is moved parallel with longitudinal axis. Thickness is read directly in .000" on the scale (background). This method not only tells varying thicknesses of a cylinder, pipeline, boiler tube, or vessel but also enables "pinpointing" of areas which are more severely corroded internally.

(Vidigage non-destructive thickness tester is a product of Branson Instruments, Inc., Dept. CP, 436 Fairfield Ave., Stamford, Conn. . . . or for more information check CP 7957 on handy form which is located opposite last page.)

to CONTROL CORROSION *where only* MINIMUM SURFACE PREPARATION *is possible*

use the Amercoat 33 over 86 System

There is no substitute for ideal surface preparation. But every maintenance engineer is confronted with corrosion problems in locations where only minimum surface preparation is possible. The Amercoat 33/86 System is amazingly helpful in many of these cases. Here is how it works:

FIRST: apply Amercoat 86 Primer, brushing it well into the surface. This unique primer has a high tolerance for surface contamination and will adhere to many problem surfaces.

- It is both inhibitive and chemically resistant.
- It stifles underfilm corrosion and under-cutting.
- It forms a truly compatible base for vinyl topcoats, eliminating peeling and lamination.

THEN: apply Amercoat 33, the time-tested vinyl coating. Because of its high solids content, you get a thicker, heavier coating – "more mils per gallon". Applied by hot spray* or conventional spray, it takes fewer coats of Amercoat 33 to build the required film thickness.

In addition, you get more economical protection per square foot per year because Amercoat 33 is formulated specifically for maximum chemical resistance and for severe weathering conditions.

**Follow the line of MOST resistance*

**You have the confidence of knowing that more Amercoat 33 has been applied by hot spray than any other vinyl maintenance coating! No need to stock two types of material.*

If you have a difficult corrosion problem in your plant, perhaps we can help you. Our fifteen years of specialized experience is at your service. Write for literature and the name of the trained Amercoat representative in your city.

Amercoat CORPORATION
Dept. FC,
4809 Firestone Blvd.,
South Gate, California

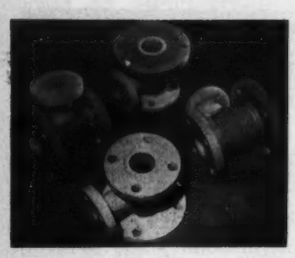
When inquiring check CP 7958 opposite last page

NEW TEFLON Shapes from DORE

TEFLON AGITATORS



This new TEFLON Agitator replaces the conventional glass covered agitator used in glass lined equipment. It will not chip or break since it is not brittle. The blade, made of solid TEFLON, is driven by a TEFLON covered steel shaft . . . it is not driven by TEFLON. The agitator is 72" in overall length with a 36" blade.



TEFLON TEES

Flanged TEFLON Tees for use in glass piping systems are available for practically the entire range of pipe sizes. They have a working pressure of 75 p.s.i. at 250 deg. F.

TEFLON ENGINEERING

. . . by DORÉ

If you handle corrosives, there is a place for TEFLON in your operations — and the place to get the TEFLON shapes and special equipment you need is John L. Doré Company.

We have the engineering skill and production facilities to design and build the special TEFLON shapes you need. Send us your requirements and we'll submit a solution with TEFLON.

John L. Doré Co.

SALES AGENTS IN U.S.A. FOR JOHN L. DORE, INC.
Du Pont's Teflon • Kellogg's Kel-F • Hi-Quality Nylon
P. O. BOX 7772 • HOUSTON 7, TEXAS

When inquiring check CP 7959 opposite last page

corrosion control



Filling carboys of sulfuric acid at Globe. The 1½" lines are PVC. Pipe formerly used for this purpose usually failed in three or four months and, as can be seen, leakage eroded concrete retaining wall. Six months after installation the PVC lines show no signs of deterioration

Heavy costs for piping maintenance plus necessity for a perpetually large inventory of pipe and fittings prompted The Globe Chemical Company to switch to —

PLASTIC PIPE for all acid handling

Sulfuric, nitric, muriatic, phosphoric, and glacial acetic acids now conveyed with great savings in time and money — and without hazards formerly encountered

Problem: Failure of various metal and alloy pipes at three to twelve month intervals necessitated replacement of part or all of piping, often created formidable hazards, and interfered with scheduled operations at The Globe Chemical Company plants in Cincinnati, Dayton, and Louisville. Leakage of corrosives handled by pipes proved costly. Scale reduced ID dimensions as it accumulated, created pressure losses, and endangered product purity.

Globe is a major distributor of acids, solvents, and chemical compounds. Year after year, piping maintenance had continued to represent a substantial percentage of overhead costs. In addition, there had to be a perpetually large inventory of pipe and fittings so that piping failures could be promptly remedied.

Corrosives conveyed are, primarily, 77-96% sulfuric, 61.4% nitric, 37-38.5% muriatic, 75-85% phosphoric, and 99.5% glacial acetic acid. Temperatures are atmospheric and pressures do not exceed 100 psi.

Solution: In September 1954, Globe decided to switch to plastic piping for all services — the changeover is now almost complete. The plastic is polyvinyl chloride, which was selected after laboratory and field tests indicated that it was the most suitable material. PVC piping ranges from 1¼ through 2" and is fabricated with unplasticized

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester, N.Y.



Testing PVC fittings for Globe's plastic pipelines. Review of test data resulted in standardizing with injection-molded fittings

PVC, injection-molded, screwed fittings.

Results: Since the PVC pipe and fittings have been in use there have been no pipe failures nor are there any signs of deterioration. Thus, expense of replacing pipe at short intervals, formerly unavoidable, has been eliminated. Also, costly waste of products has been stopped. Hazards of leakage caused by corrosion are a thing of the past — as are shutdowns due to pipe failure.

Initially, Globe also found, the cost of plastic piping and screwed fittings is less than comparable pipe and fittings previously used. Furthermore, since PVC will satisfactorily carry all acids in all concentrations that the company handles, a large inventory of pipe is no longer required. The area once needed for pipe storage has been released for other purposes.

Since scale is no longer present, Globe's reagent and technical grades of acids are completely protected against discoloration and contamination. Formerly, pipes had to be flushed out carefully before startup to assure high-purity products.

Other advantages reported are ease of installation and dissassembly of the lightweight pipe and the fact that it needs no painting. The latter is particularly important since more than 50% of Globe's piping is outside and much of it is subjected to acid fumes. And finally, the PVC fittings employed — made by the Hendry process for injection molding — have been found appreciably stronger than fittings made by compression molding processes, on a strength-to-weight basis.

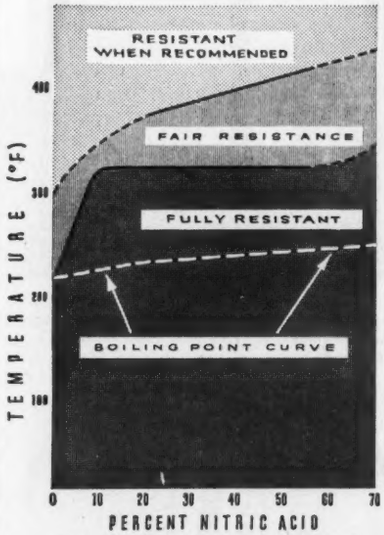
(Injection-molded PVC fittings are products of Tube Turns Plastics, Inc., Dept. CP, 224 E. Broadway, Louisville 1, Ky. . . . or for more information check CP 7960 on handy form opposite last page.)

NOW! Process HNO_3 in vessels *guaranteed* against corrosion!

Now you can have a year's free "vacation" from the expense of repairing or replacing equipment damaged by corrosion.

Pfaudler's exclusive one-year guarantee against corrosion is available on all acid-alkali-resistant glassed steel equipment for use with products on which field and laboratory data provide evidence of sufficient corrosion resistance. For example, a vessel for processing chemically pure 60% nitric acid solution at 300° F 24 hours a day, 365 days a year can be guaranteed for a full year, and will actually deliver excellent service for as many as 15 years or more!

Similarly, many other corrosives can be covered by the same type of guarantee – and glassed steel equipment can actually give you 5 to 15 years more service beyond the guarantee period.



This chart shows the high resistance of glassed steel processing pure nitric acid 24 hours a day, 365 days a year. This type of laboratory data is basis for Pfaudler's unusual corrosion guarantee.

Under the terms of the Pfaudler corrosion guarantee, you receive free on-the-spot inspection and repair service on your acid-alkali-resistant glassed steel vessel, should it be made inoperable by corrosion within one year after date of purchase. Factory repairs will be performed on an F.O.B. factory basis. Operating conditions covered by the guarantee are agreed upon at time of purchase.

A wide range of corrosives may now be processed in Pfaudler corrosion-guaranteed equipment. Agreements are being written for any acid or alkali solution for which laboratory tests indicate sufficient corrosion resistance.

Right now, you may have an expensive corrosion problem that can be cured by this unusual guarantee on equipment. Write for further information.

When should you use a rotary seal and when a stuffing box?

Some of our customers have run into situations that *demand* the protection of a rotary seal. For them, we have supplied mechanical seals with outstanding success. We have several mechanical seal designs available on Pfaudler glassed steel vessels, all of which give excellent results under specific service conditions.

But many of our customers face the problem of choosing between a seal and a stuffing box. With all the latest technical improvements, seals in many cases involve a greater expense than stuffing boxes. The question is—should you pay the extra cost, in order to get perfect sealing?

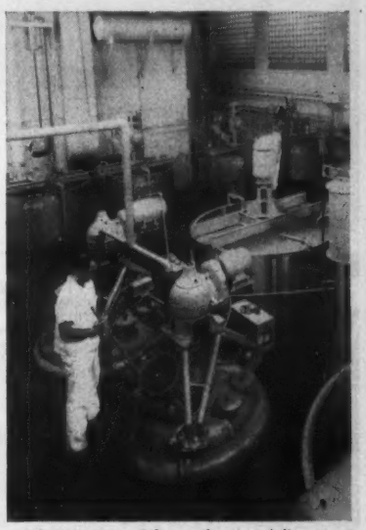
Cost vs. Sealing

There's no pat answer. To give you widest choice possible, Pfaudler offers mechanical seals as well as two types of stuffing boxes. For operating economy, the stuffing boxes are supplied with a Teflon ring which protects packing against corrosion, and increases protection of your product against contamination.

The high-duty stuffing box has a number of "plus features," including: automatic lubrication; a replaceable alloy sleeve for added corrosion protection; and a lantern ring that does double duty as a no-play bearing.

The low-duty stuffing box is economical where leakage is not a prime problem. Much smaller than the high-duty stuffing box, it uses a Teflon ring in the lowest position, to keep corrosive vapors from contacting the asbestos packing.

For help in selecting the type of seal that will best solve your problem, we suggest you consult your Pfaudler representative.



Equipment used for performing delicate hydrolysis at R.K. Laros Company.

In this business, he *dares not* risk corrosion!

Processing a blood volume expander with hydrochloric acid is a challenge to both methods and equipment.

On one hand you've got an acid that's sharply corrosive. On the other, you've a product that *must* be kept pure.

The Chemical Division at R. K. Laros Company uses the equipment you see here to do such a job. Twin glassed steel reactors perform the delicate hydrolysis. Supplied by Pfaudler, they resist attack by hydrochloric acid and provide a safe, pure product.

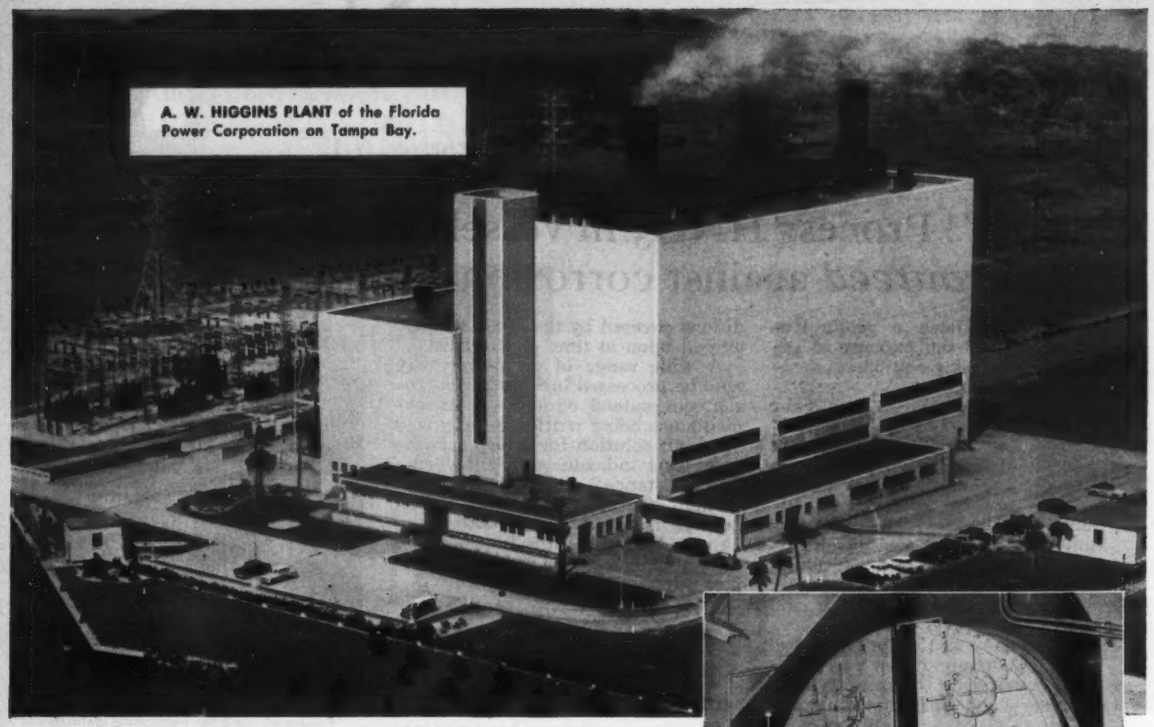
Whether you're looking for better corrosion resistance as a means of keeping your product free of contamination, or as a way to cut the cost of replacing equipment, you may be able to solve your problem with Pfaudler glassed steel.

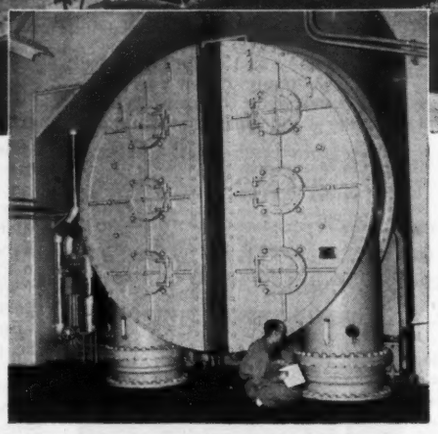
This remarkable material of construction combines the corrosion resistance of glass, plus the structural strength of steel. For further information, consult your Pfaudler representative or write to our Rochester headquarters.

Got a chemical project that is bothering you?

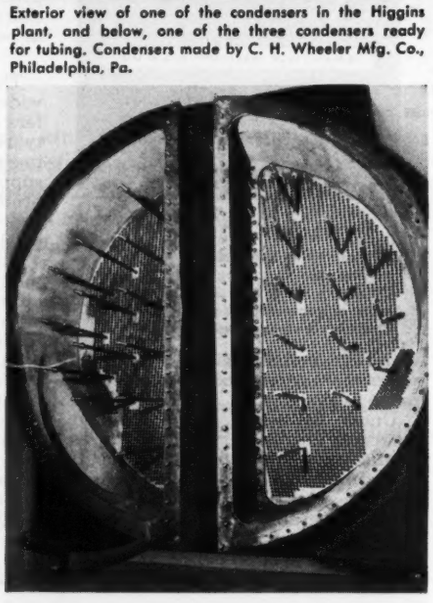
We are staffed and ready to help you or your consultants in working out the best combination of materials and equipment to attain desired yields. Why not check with us?

When inquiring check CP 7961 opposite last page





Exterior view of one of the condensers in the Higgins plant, and below, one of the three condensers ready for tubing. Condensers made by C. H. Wheeler Mfg. Co., Philadelphia, Pa.



REVERE 10% CUPRO-NICKEL SOLVES CORROSION PROBLEM FOR FLORIDA POWER CORPORATION

About six years ago the Florida Power Corporation was experiencing condenser tube failure at its Bayboro plant in St. Petersburg. Revere's Technical Advisory Service was called in, and recommended replacing the failed tubes with 10% Cupro-Nickel, which has a marked resistance to corrosion from brackish water. This recommendation proved successful. As a result, when Florida Power planned to add a new 135,000 KW plant, named after A. W. Higgins, Revere 10% Cupro-Nickel tubes were specified. All three units in the new plant are thus tubed. The tubes are 7/8" OD x 18 BWG, 24' 7" long. A few spares are kept on hand for possible replacement, but with regular cleaning to remove debris (small bits of shell, etc.), the tube life has been exceptional, thus adding to economy of operation and increased service to a fast-growing area. . . . If you have questions regarding condenser tube selection and service, get in touch with the nearest Revere Sales Office. Remember to specify Revere.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N.Y.

Sales Offices in Principal Cities, Distributors Everywhere.

When inquiring check CP 7962 opposite last page

Protects insulations in outdoor area where metal jacketing corroded after one week's service . . .

asphaltic coating can be sprayed or brushed on insulation

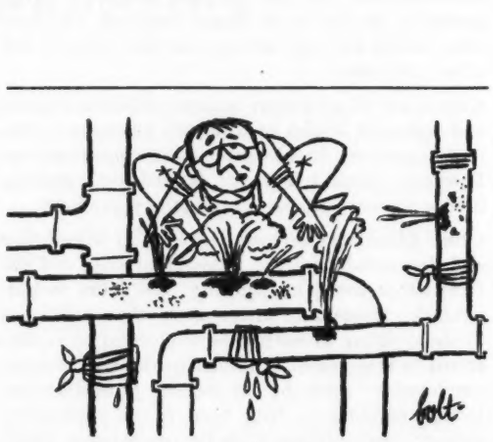
Problem: To protect insulation from weathering in outdoor applications, National Petro-Chemical Corporation at Tuscola, Ill. was using a metal type jacketing. While this was giving good service in all the other sections of the plant, when used in the alcohol processing area it corroded out in less than a week. Caustic, SO_2, and sulfuric acid did most of the damage.

Solution: Metal insulation jacketing was replaced by ordinary roofing paper and a single coating of Gilsomastic coating was applied over it.

This coating is made of gilsonite modified with other asphalts and inert mineral pigments. It's black in color and is applied by either spray or brush. One gallon usually covers from 50 to 100 square feet. Drying time is about 12 hours. Thinners recommended for the material are naphtha for spray applications and mineral spirits for brushing. Heat resistance is excellent up to 250°F.

Results: Coatings have been exposed to acid atmosphere for over a year now without deteriorating. Weathering has also had little effect on the coatings.

(Gilsonite is a product of American Marietta Company, Valdura Division, Dept. CP, 101 E. Ontario St., Chicago 11, Illinois . . . or for more information reader may simply check CP 7963 on the convenient Reader Service slip which is located opposite last page.)

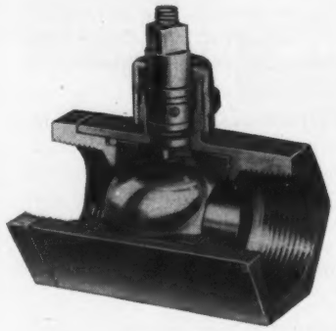


For better ways to whip corrosion . . .

. . . try the handy Product Directory (starting this issue on page 185). You'll find it an easy "page-locator" for ideas, materials, services.

Ball valve available in 316 stainless

For chemical applications, manufacturer's ball valve has been recently made available in 316 stainless steel. Unit can also be obtained



in 303 stainless, with Teflon trim. (Double-Seal ball valve is product of Jamesbury Corp., Dept. CP, 383 Shrewsbury St., Worcester 4, Mass. . . . or for more information reader may simply check CP 7964 opposite last page.)

Brochure on lining tank cars

Four-page illustrated brochure describes proper methods of lining and coating tank cars. Sheet linings, liquid synthetic resin coatings, sprayed metal coatings, and combination coatings are covered. Illustrations show steps taken in lining tank cars.

Brochure on lining and coating tank cars is issued by Metalweld, Inc., Dept. CP, Scotts Lane & Abbottsford Ave., Philadelphia 29, Pa. When inquiring reader may simply check CP 7965 on convenient Reader Service slip located opposite last page.

For more information on product at right, specify CP 7966 . . . see information request blank opposite last page.

The one chemical service valve

1. No metal-to-metal contact
2. Does not stick
3. No small parts subject to quick corrosion
4. Requires no packing
5. Non-lubricated
6. Minimum maintenance
7. Renewable sleeve and plug for maximum life

seven ways better

In the past, just one or two of these advantages were enough to justify the use of a particular chemical service valve. Now DURCO engineers have designed a valve with all seven features. With several thousand in operation in the three years since they were introduced, the list of successful applications is large and varied. If you have a troublesome corrosion problem, call the DURCO representative near you, or write The Duriron Company, Inc., Dayton, Ohio.

DURCO TYPE F VALVE



*Registered trade-mark of E. I. duPont de Nemours & Co., Inc., for its tetrafluoroethylene resin.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON COMPANY, INC., Dayton, Ohio



New CRANE Corrosion-resistant valves in 18-8 SMo and Craneloy 20

Gate, Globe, Angle and Check Patterns

Few valves for process industries have ever received the quality treatment given this new Crane line—at prices you'll find O.K.

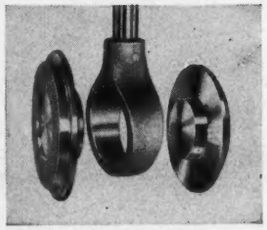
Note, for instance, the unique yet simple split-wedge disc construction in the gate valves. Those dual identical discs are free to rotate in their holder—the most effective design for resisting galling. The trunnion shape at the back of each disc assures even distribution of closing forces. You couldn't buckle them if you tried.

The globe and angle valves give equally outstanding control of corrosive fluids. A new type disc-stem connection, with minimum clearances, practically eliminates vibration. By placing seating load closer to seats, it provides easier, more accurate closure.

Check valves feature compact, thoroughly proved, non-slamming design.

Throughout, these valves are built for better service in your choice of Crane 18-8 SMo Stainless Steel or Craneloy 20. Both lines come with screwed or flanged ends.

ASK FOR THIS CATALOG—Full information including service suggestions given in circular AD-2080—available from your Crane Representative or by mail. Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers everywhere.



New split-wedge disc in gate valves combines the benefits of free rotation with uniform seat load pressure.

for the THRIFTY BUYER

CRANE CO.

VALVES • FITTINGS • PIPE
KITCHENS • PLUMBING • HEATING

CRANE'S FIRST CENTURY...1855-1955

When inquiring check CP 7967 opposite last page

CORROSION CONTROL

Two-coat protection means economy with neoprene-base coating . . .

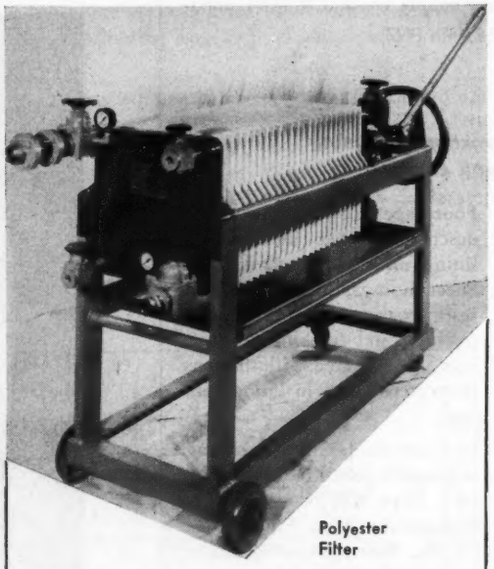
expensive priming or preparation not necessary

Uses: Protection of structural steel, ducts, tanks, process equipment, gutters, railings, pipes, exposed to corrosive action and weather elements.

Features: Coating is comparatively economical, since it requires only two (or at most three) coats to do the job, without any expensive priming or preparation.

Description: Neoprene-base coating provides a rubber film, high in tensile strength and elongation, that has excellent resistance to abrasion, scratching, or chipping. It cures rapidly, and it is highly resistant to polar solvents, acids, alkalis, and salts. Waterproofing qualities are excellent and action of sunlight and outside weather conditions is resisted.

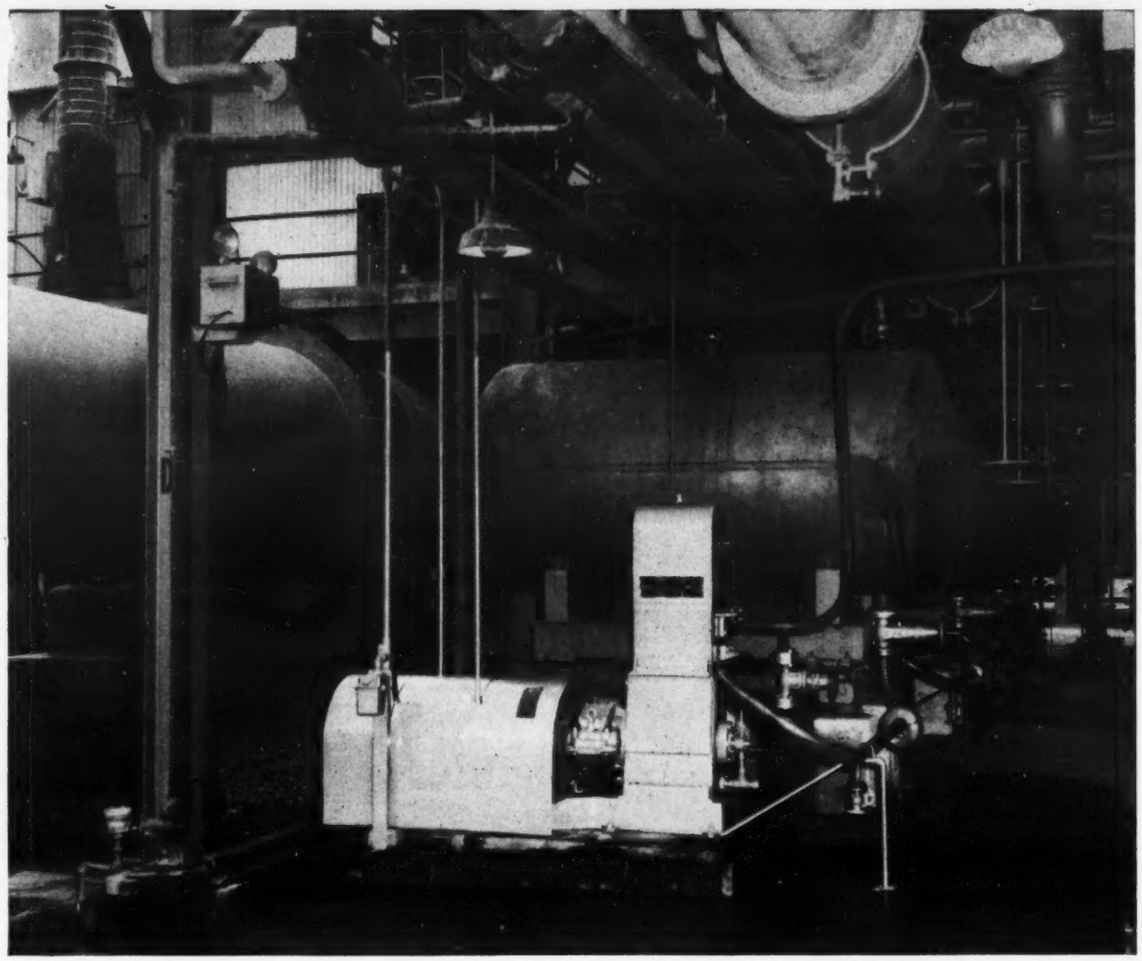
(Nerva-Kote TNE neoprene-base coating is a product of Rubber & Plastics Compound Co., Inc., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. Check CP 7968 opposite last page.)



Polyester Filter

Polyester frames on this filter press are not affected by non-oxidizing acids, corrosive salts, and weak alkalis. They are satisfactory for some alcohols, formaldehyde, refinery crudes, and gasoline — but not for chlorinated solvents, or strong alkaline solutions. The plastic will withstand temperatures up to 300°F. Filter is being successfully operated in the pharmaceutical and oil industries.

(Filter is a product of Hercules Filter Corp., Dept. CP, 204 21st Ave., Paterson, N.J. . . . or for more information check CP 7969 opposite last page.)



Another Chemical Pumping Job—handled by ALDRICH

This scene is the plant of a leading manufacturer of explosives, where the Aldrich Triplex Pump pictured in the foreground pumps nitric acid at the rate of 185 lbs. per minute against 400 psi maximum pressure.

It's one of many jobs Aldrich Pumps are called upon to do in the chemical industries. These versatile pumps are ideal wherever applications involve corrosion, abrasive materials, high viscosity or high pressure. In addition to nitric acid, among the many liquids handled by Aldrich Pumps are caustic solutions, fatty acids, acetic acid, aqua ammonia, anhydrous ammonia, as well as liquids encountered in the petroleum refining, petroleum chemical and other industries.

Several types of Aldrich Pumps are available to meet your specific needs. For automatically controlled delivery Aldrich-Groff "POWR-SAVR" Pumps can handle any free-flowing liquid at discharge pressures from 300 to 15,000 psi and are available in six sizes—from 2″ to 6″ stroke and from 5 to 125 bhp. (For information, write for Data Sheet 65.) For medium to high pressure service you may need one of the many Aldrich Constant Stroke Pumps—the Direct Flow Triplex or Multiplex Pump (Data Sheets 64, 64A, 64B).

Take advantage of our broad experience in building pumps for the chemical industry and let us make specific recommendations to meet *your* chemical needs. No matter what your problem, we welcome your inquiries or requests for literature.

The Aldrich Pump Company

23 GORDON STREET • ALLENTOWN, PENNSYLVANIA

Representatives in Principal Cities

ALDRICH

When inquiring check CP 7972 opposite last page

Depend on LADISH *Co*

- Carbon Steels
- Carbon-Molybdenum Steels
- Chromium-Molybdenum Steels
- Nickel Steels
- Chromium-Nickel Steels
- Chromium-Silicon-Molybdenum
- Wrought Iron
- Chromium Type Stainless
- Chromium-Nickel Stainless
- Molybdenum Type Stainless
- Wrought Aluminum
- Aluminum-Copper Alloys



BUTT WELDING FITTINGS

½ inch through 42 inches ..

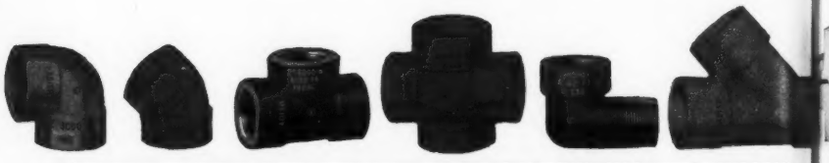
Schedules



FORGED CORROSION RESISTANT—LIGHT WEIGHT and A.S.A. FLANGE

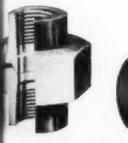
½ inch through 24 inches ..

FORGED C



FORGED SCREWED OR SOCKET WELDING FITTINGS and UNIONS

⅛ inch through 4 inches.



FORGED

150 lb. C



LARGE DIAMETER AND T.E.M.A.* STANDARD FLANGES up to 20 feet O.D.

*Tubular Exchanger Manufacturers Association



LONG WELDING NECKS

up to 24 inches, 150 lb. through 2500 l

FOR FIT

TO MEE

You get pr
the comple
material in
... are proc
... and id
verification
tests made

For *compl*
Ladish lin

THE COMP

L

District O
Chicago
Los Ange

Complete Service . . .



BUTT WELDING FITTINGS

Schedules 5S, 10S, 40S, 80S, and other Schedules and wall thickness.



FORGED CORROSION RESISTANT—LIGHT WEIGHT and A.S.A. FLANGES

150 lb. through 2500 lb. pressure ratings.



FORGED SCREWED OR SOCKET WELDING FITTINGS and UNIONS

150 lb. Corrosion Resistant and 2000 lb. through 6000 lb. ratings.

FOR FITTINGS FROM ANY FORGEABLE MATERIAL TO MEET YOUR SERVICE REQUIREMENTS

You get prompt, efficient service when you specify and order from the complete Ladish Controlled Quality line. Fittings *in any forgeable material* in virtually every type, size, wall thickness or pressure rating . . . are produced to one uncompromising Controlled Quality standard . . . and identified with heat code symbols pioneered by Ladish as verification of metallurgical integrity resulting from exhaustive tests made in the Ladish metallurgical laboratories.

For *complete service* on your fittings requirements, depend on the Ladish line and the services of your Authorized Ladish Distributor.

THE COMPLETE *Controlled Quality* FITTINGS LINE

LADISH CO.

CUDAHY, WISCONSIN

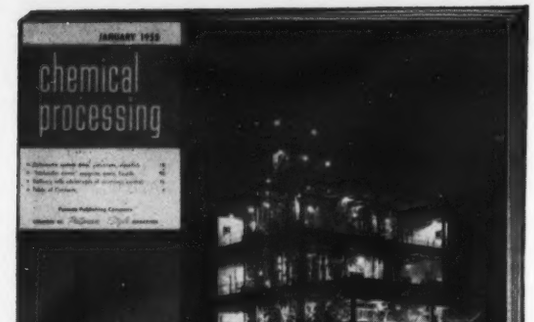
MILWAUKEE SUBURB

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland Chicago • St. Paul • St. Louis • Atlanta • Houston • Odessa • Tulsa Los Angeles • San Francisco • Seattle • Havana • Mexico City • Brantford, Ont.

L

TO MARK PROGRESS

- Aluminum-Manganese Alloys
- Deoxidized Copper
- Hastelloy
- Titanium
- Forging Brass
- Everdur Bronze
- Silicon Bronze
- Manganese Bronze
- Wrought Nickel
- Nickel-Copper Alloys
- Inconel
- Monel



Have you wondered why this magazine comes to you ...without charge?

MAYBE, LIKE MANY others, you've always thought that all publishers make their money, or much of it, from the subscriptions they sell.

'Tisn't so . . .

. . . no, 'tisn't so. With the exception of a few general magazines (e.g. READER'S DIGEST*) that sell hundreds of thousands—some millions of copies—most industrial publishers with relatively small circulations actually lose money on their subscription sales.

Then how do industrial publishers make money? As you can guess, they make it from the advertising they sell. *Total subscription sales are hardly a "drop in the bucket" compared to advertising revenue.*

Advertisers demand best coverage

Since advertisers pay the bills, they demand best possible coverage of all important men in the field. So it's up to the publisher to publish the most readable magazine possible . . . then to insure coverage of the maximum number of the best readers.

You can't do that by selling subscriptions—sales costs are high—a large share of the subscribers cancel each year—and no matter how much time, money, and pressure is used there are always some of the important men who will never buy.

As you can see, the most effective method of getting the kind of coverage advertisers want is (a) to hand-pick the most important men; (b) send the magazine to ALL these men; and (c) to make the magazine so interesting, so valuable that they will want to read it.

That's why . . .

. . . Chemical Processing is sent only to qualified readers . . . selected management and technical key-men in the chemical industry; that's why you get Chemical Processing at no cost—that's why we spend thousands of dollars on each issue to make it worth your time to read it. For you are an important reader in the chemical processing field.

*Reader's Digest has since announced that they will accept advertising, beginning with their April, 1955 issue.

Chemical Processing

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines
. . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

PUTMAN PUBLISHING COMPANY
111 EAST DELAWARE PLACE • CHICAGO 11, ILLINOIS
Publishers of: FOOD PROCESSING • CHEMICAL PROCESSING • FOOD BUSINESS
"Executive Magazines for Industry"

PUTMAN PP PUBLISHING

EPA NBP

For more information on products advertised by the Ladish Co. on inside two pages specify CP 7973 . . . see information request blank opposite last page.

Offers clad metals for services where highly-corrosive gases, liquids are handled . . .

thickness of cladding is uniform and material may be specified to suit requirements

Uses: In processing and other equipment handling highly-corrosive gases and liquids.

Features: Clad plates are produced by heating an assembly of the cladding metal and the base plate, separated by a thin layer of brazing material. During the heating process, a high vacuum is introduced between the two metals and a resulting high pressure is maintained on the exterior surfaces.



Plate to be clad, shown entering bonding furnace at company's Birmingham plant. No rolling is involved

Since no rolling is required, thickness of cladding is uniform and a wide variety of metals may be clad. Brazing material used also serves as a barrier, preventing carbon migration from base plate to clad surface.

Description: Clad metals are available in nickel-base steel alloys such as chromium, chromium-nickel, and nickel alloys, Monel and Inconel, and in other combinations especially made for particular corrosive services.

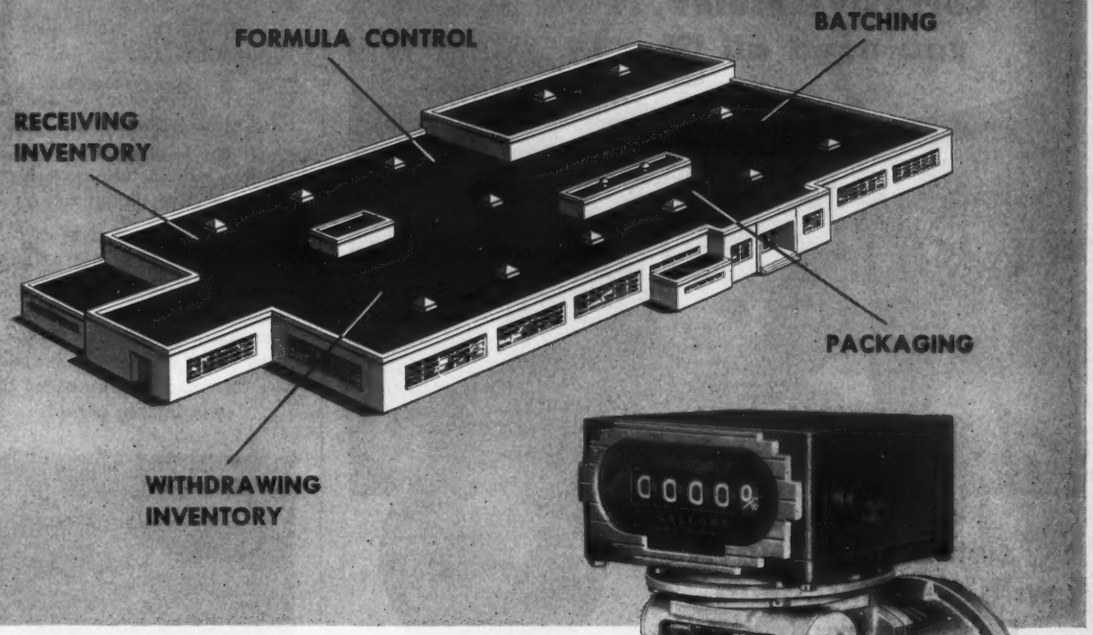
(Cladding method and clad product, both trademarked Hortonclad, are developments of Chicago Bridge and Iron Co., Dept. CP, 332 S. Michigan Ave., Chicago 4, Ill. . . . or for more information check CP 7970 on handy form opposite last page.)

Data on corrosion-proof ventilating systems

Complete data on corrosion-proof ventilating and exhaust systems is presented in eight-page bulletin. Among topics covered are ducting and fitting, fans and blowers, hoods, and weather caps.

Bul on ventilating systems is issued by American Agile Corp., Dept. CP, PO Box 168, Bedford, Ohio. Specify CP 7971 opposite last page.

Accounting at Every Liquid Handling Point



ROCKWELL ROTOCYCLE METER
Cutaway to show the all-revolving rotor construction

Rockwell Industrial Meters

Guard Your Liquids as You Guard Your Cash

Put Rockwell Industrial Meters to work. Then you'll control your costs . . . control your processes . . . control your end product quality. Rockwell meters are basic accounting tools for verifying purchases, for stopping losses, for inventory and departmental control and for tax analysis purposes. They will accurately measure most any liquid that can be piped. Available in all sizes and several types for every requirement. For full details use coupon or write.

"316" Stainless Steel Meter

FOR CORROSIVE LIQUIDS

This meter, made entirely of type 316 stainless steel is the answer to many a measurement problem in the Food, Chemical, Drug and Industrial Processing fields. It resists corrosion. Made in two sizes rated at 100 and 200 gpm. Quantity control valves, strainers and a variety of registers available. Described in bulletin OG-406.

YOU CAN RELY ON ROCKWELL

CLIP COUPON—MAIL TODAY

ROCKWELL MANUFACTURING COMPANY Dept. 106 G
Pittsburgh 8, Pennsylvania

Gentlemen:
I am interested in measuring _____ (Name of Liquid)
Pipe Size _____"
Working Pressure _____psi Temperature _____°F max.
Max. Flow Rate _____gpm Min. Flow Rate _____gpm

YOUR NAME _____
COMPANY _____
STREET _____
CITY _____ ZONE ____ STATE _____

When inquiring check CP 7974 opposite last page



get them all in 1.... with Hills-McCanna Diaphragm Valves

Ordinary valve worries of leaking packing, clogged bonnets and corroded working parts are eliminated by the unique design of the Hills-McCanna Saunders Patent diaphragm valve. A tough, resilient diaphragm completely *isolates* the bonnet and its working parts from the valve body. The *cushion* closure is drip tight. Surface irregularities or scale are no cause of leakage because the diaphragm *accommodates* itself to them . . . like a tire to small stones. Packing worries are *easily* forgotten, too—no packing is needed because no fluid can enter the bonnet.

Available with choice of 15 diaphragm materials, body materials of *any* machinable alloy and a choice of linings, Hills-McCanna valves range in sizes from ⅜" through 14". May be used at pressures to 150 psi, temperatures to 350° F. Choice of remote, handwheel or lever operators.

If *you* valve corrosives, write for further information today! HILLS-McCANNA CO., 2370 Nelson St., Chicago 18, Illinois.

HILLS-McCANNA

saunders patent diaphragm valves

Also Manufacturers of
PROPORTIONING PUMPS
FORCE FEED LUBRICATORS • MAGNESIUM ALLOY SAND CASTINGS

When inquiring check CP 7975 opposite last page

CORROSION

Protect condenser tubes from erosion . . .

stainless clips won't affect heat transfer rate

Uses: Protecting condenser tubes from erosion. Occasional inspection of tubes for signs of erosion will determine whether protector clips should be applied.

Features: Use of clips does not appreciably affect heat transfer rate of condenser tube. While clip does not repair an eroded tube, it does resist further erosion and in many cases it may not be necessary to replace clip-protected tube for a considerable period.



Description: Open-side stainless steel clip, made from 26-gage metal with slightly flaring side to provide tension, is attached directly to condenser tube (see photo). Clips are available in 2' lengths for ¾-, ⅞-, and 1"-diameter tubes.

(Clips are a development of Allis-Chalmers Mfg. Co., Dept. CP, Box 512, Milwaukee 1, Wis. Check CP 7976 opposite last page.)

Describes coal tar epoxy coating

Four-page technical data sheet describes property of Tarset, a recently-developed coal tar epoxy coating.

Technical data sheet on Tarset is issued by Pittsburgh Coke & Chemical Co., Protective Coating Div., Dept. CP, Grant Bldg., Pittsburgh 19, Pa. Specify CP 7977 opposite last page.



VANTON'S External Bearing

X-B PUMP

Without stuffing box, gaskets or valves!

The Vanton corrosion resistant "flex-i-liner" self priming rotary type plastic pump is available in a new design that permanently protects all bearings from fumes or chemical attack.
Low maintenance is assured since shaft bearings are external and rotor assembly is stainless steel. The only wearing part is the quickly replaceable low cost flexible liner.
Capacities range from fractional to 5 gpm with 0-50 psi discharge pressures . . . vacuum to 26" Hg. A wide selection of plastic and rubber body blocks and "flex-i-liners" makes the XB ideal for handling corrosive liquids, gases, viscous fluids or abrasive slurries.

VANTON
PUMP & EQUIPMENT CORP.
Division of Cooper Alloy Corporation • HILLSIDE, N. J.

When inquiring check CP 7978 opposite last page

NoDrip® ...STOPS CONDENSATION DRIP



NoDRIP PREVENTS RUST — ANYONE CAN APPLY

NoDrip plastic coating is easily applied to tanks, containers, suction lines, vats, pipes, walls, ceilings, etc. NoDrip adheres to metal, concrete, brick, plaster. It forms a seamless 100% moisture-proof covering that is effective as soon as dry. Acid, alkali and brine resistant.

FREE...
Interesting 32-page Handbook shows what NoDrip is and what it does.
SEND COUPON TODAY

SEND NoDRIP HANDBOOK
NAME_____
ADDRESS_____
CITY_____ STATE_____

J. W. MORTELL CO. • 530-C BURCH ST. • KANKAKEE, ILL.
TECHNICAL COATINGS SINCE 1895

When inquiring check CP 7979 opposite last page



Chempro's new Style FM-4 bearings, bushings, washers, etc., have given remarkable service in pumps, mixers and reactors operating under highly corrosive conditions. Made of Teflon,* glass, graphite and an inert lubricant, Style FM-4 bearings and bushings are hard, corrosive-resistant, have a low coefficient of friction, and compare favorably in wearability with those made of metal.

FOR EXAMPLE:

If other bearing materials on your pumps have failed due to corrosion... use **FM-4.**

If the shaft bearings on your mixers and reactors must be compatible with the product ...use **FM-4.**

Also available in rod, tube and cylindrical shapes in a wide range of sizes and wall thicknesses. Our engineers will be glad to assist you in developing the product to meet your specific needs.

Write for Bulletin CP554.

THE ORIGINAL FABRICATORS OF TEFLON PACKINGS AND GASKETS

*duPont Trademark

CHEMICAL & POWER PRODUCTS, Inc.

9 Broadway, New York 4, N.Y.

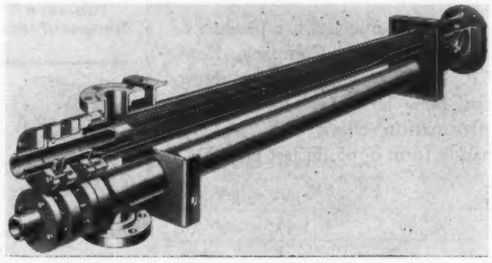
When inquiring check CP 7980 opposite last page

Chemical nickel-plating process suits finned-tube exchangers for corrosive services . . .

U-shaped fins welded to tubes extend transfer surface by a factor of more than 10

Uses: Especially built for heavy-duty service where corrosion or contamination is a factor, heat exchanger is highly adaptable to changing load requirements and changes of duty within a given plant.

Features: Unit may be obtained with nickel-plated interior and exterior surfaces. Chemical nickel-plating process used produces an excellent protective surface of uniform thickness providing corrosion resistance equal to or better than pure or wrought nickel in nearly all applications.



Removal of tubes from exchanger is simple

Description: Standard fin tube heat exchanger sections consist of a double-pipe arrangement of company's externally-finned tubes. They are designed for service where the conventional bare-tube exchanger is unsuited, or where fluid being heated or cooled has an appreciably higher resistance to the exchange of heat than the fluid used for heating or cooling.

Sections will be offered in a variety of sizes, lengths, materials, and pressures. Tubes from individual units may be withdrawn without displacing connecting pipe — even when units are installed in banks with interconnecting piping. Removal is made possible by elimination of split ring at the tube-to-shell joint.

Finned tubes consist of a tube of seamless steel to which is welded U-shaped longitudinal fins, thereby extending the heat transfer surface by a factor of more than 10. Fins are integrally bonded to pipe, providing a "one-piece" construction having great strength of adherence, anti-fouling qualities, ease and simplicity of cleaning.

(Fin heat exchangers are products of ALCO Products, Incorporated, Dept. CP, 143 Erie Blvd., Schenectady 5, New York . . . or for more information reader may simply check CP 7981 on the convenient Reader Service slip which is located opposite last page.)

SPECIALISTS IN STAINLESS STEEL TUBING



DAMASCUS TUBE COMPANY
STAINLESS STEEL TUBING AND PIPE
Greenville, Pennsylvania

When inquiring check CP 7982 opposite last page

Save time, costs, property...with HYDRALT* ASPHALT (Clay-Type) Coatings

..."one coat" protection for all around the plant

Don't let moisture, fumes, smoke and weather attack your property and equipment. Protect your metal and masonry . . . your insulating materials . . . with *one* coat of Flintkote Hydralt.

Yes, even one coat of Hydralt gives thick film, more economical protection against corrosion, rust and the effects of moisture infiltration than 8 or 10 coats of paint. And think of the time savings, too.

Hydralt Protective Coatings are unique (clay-type) asphalt emulsions. Films about 3/64" thickness have provided completely satisfactory resistance to weather in industrial atmosphere for over 24 years.

These Hydralt coatings are reinforced within themselves . . . will not crack, craze, or alligator under exposure. Will not soften or flow under heat. Won't sag or peel off.

They are odorless. Non-flammable to apply by brush, spray or trowel.

Flintkote's line includes the right products for your protective coating needs. For light reflective surfaces . . . Asphalt base Aluminum Paint. For oil or grease resistance...ORTAR† Emulsion Coating.

Want more information about these products? Just write...or look us up in Sweet's.

Over 50 years of specialized experience . . . by phone, mail or personal call. No obligation.

*Reg. U. S. Pat. Off.
†Trademark of The Flintkote Company



Protect structural steel with Flintkote Hydralt Coatings.



Masonry structures resist weather better with Hydralt.



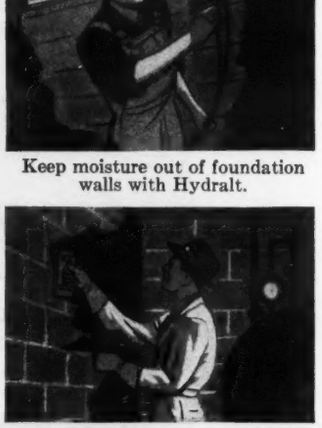
Apply Flintkote Aluminum Paint over Hydralt, for light color.



Protect insulating materials from weather with Hydralt.



Keep moisture out of foundation walls with Hydralt.



Keep dampness out of interiors with Hydralt.

FLINTKOTE

THE FLINTKOTE COMPANY
Industrial Products Division
30 Rockefeller Plaza, New York 20, N.Y.
Boston • Chicago Heights • Detroit
Los Angeles • New Orleans • Philadelphia
In Toronto, Ont.:
The Flintkote Company of Canada, Ltd.
In London, England:
Industrial Asphalts Company, Ltd.

When inquiring check CP 7983 opposite last page

CORROSION CONTROL

More corrosives handled by chemical pump with Teflon-ceramic seal

Designed to broaden applicability of company's stainless steel chemical pumps, seals are made of Teflon and ceramic materials. They are dimensioned to fit stuffing boxes of company's regular positive displacement pumps, and are available separately for use on these pumps now active in the field.

Seals are virtually leak-proof at shaft speeds up to 1800 rpm, and have proven satisfactory in tests for such pressures as low as 29" Hg and discharge pressures to 100 psig for fluids ranging in viscosity to 900 SSU.

(Teflon-ceramic seal is a product of Eco Engineering Company, Dept. CP, 12 New York Avenue, Newark, New Jersey . . . or for more information check CP 7984 on handy form opposite last page.)

Corrosion-resistant fasteners

Variety of fasteners fabricated from corrosion-resistant alloys are described in eight-page publication.

Vol. 20, No. 1, Issue of *Bolt News* is available from The H.M. Harper Co., Dept. CP, 8200 Lehigh Rd., Morton Grove, Ill. When inquiring specify 7985 on handy form opposite last page.

✦ ✦ ✦

THAT'S INTERESTING

Hotel has plastic skin

Tyler, Texas is the site of a hotel with a sprayed-on plastic skin instead of conventional veneer materials. Estimated average cost for applying the flexible, weatherproof, non-combustible skin is 40c per square foot.

Material used was Plastispray, a product of Liquid Plastics Corp., Dept. CP, 50-02 23rd St., Long Island City, N.Y. . . . or check CP 7985A opposite last page.

Corrosion-Resisting
INCO-CAST FITTINGS
Write for catalog price list!



90° Elbows

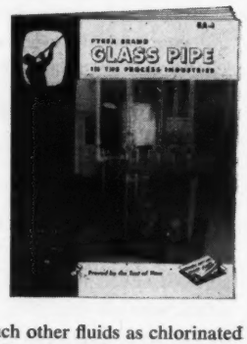
Protect product purity	Unions	Available in Monel®, Nickel and Inconel®	Tees
Crosses	All standard types • Pressure tested	Plugs	Full range of sizes • Economical in cost
Withstand high and sub-zero temperatures	Stub ends	Strong, sound, tough castings	Flanges
Reducing tees	Yours for the asking—Catalog Price List		

The International Nickel Company, Inc.
67 Wall Street
New York 5, N. Y.

When inquiring check CP 7986 opposite last page

How many of these pipeline headaches do YOU have?

☐ Corrosion ☐ Clogging
☐ Cleaning ☐ Cost
☐ Contamination



This Corning bulletin can help you

"PYREX brand 'Double-Tough' glass pipe in the Process Industries" tells how others in a variety of process industries are whipping tough piping problems with glass pipe. You'll recognize the names of most of the companies who are using PYREX pipe to handle such acids as sulphuric, hydrochloric, nitric, acetic, and such other fluids as chlorinated hydrocarbons, hydrogen peroxide, bromine, brines, low-concentration alkaline solutions, wine, milk, other beverages and foods.

The book covers a wide range of products, problems and processes. Among them you may well find problems similar to yours—solved with PYREX pipe. Bulletin EA-1 is free. Simply send the coupon or check this publication's reader service card for your copy.

Corning means research in Glass

CORNING GLASS WORKS
37 CRYSTAL STREET, CORNING, N. Y.

Please send me Bulletin EA-1: "PYREX brand 'Double-Tough' glass pipe in the Process Industries."

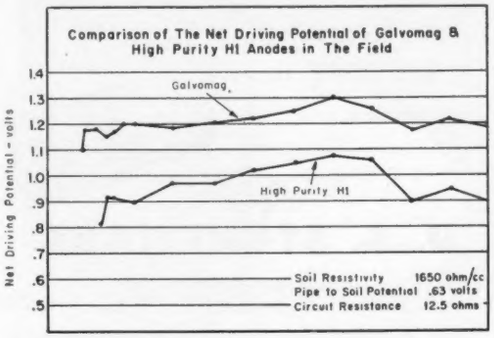
Name ..... Title .....
Company .....
Address .....
City ..... Zone ..... State .....

When inquiring check CP 7987 opposite last page

More current and more protection provided by magnesium alloy sacrificial anode . . .

installation costs are less with fewer anodes

A 20 to 30% higher potential is provided by a recently-introduced magnesium alloy anode for cathodic protection services. This anode not only achieves a high potential, but it also offers dependable current efficiencies not obtainable with high-potential, commercially-pure magnesium anodes. The alloy contains manganese and controlled amounts of impurities, such as iron, iron compounds.



High current output is demonstrated by a typical set of data shown in the curves of the accompanying chart. Data were obtained by installing two 17-lb magnesium anodes, one of high purity (H-1 in chart) and the other of low alloy (called Galvomag), on an underground pipeline having an average pipe-to-soil potential of −0.63 volts during test.

Measurements were made of the total circuit resistance using a megger-type instrument; and of the current flow by measuring voltage drop across a 0.1 ohm shunt. Net driving potential was then calculated by Ohm's Law from the current flow and total circuit resistance and plotted against time on this chart.

By this method, the two anode materials can be compared directly, even though soil resistivity changes somewhat between test locations. Many such tests were made in the field in various soils from 100 to 10,000 ohm/cc resistivity and, in every case, data substantiated laboratory tests and showed the low alloy magnesium anode had 20-30% more voltage.

Thus, in soils of medium or low resistivity, it is possible to use fewer installations to obtain the same protection, due to greater throwing power of this anode. Also, this higher net driving potential indicates that better protection can be obtained in higher resistivity soils, where it has been difficult to obtain protection with conventional sacrificial anodes, except ribbon anodes.

(Galvomag high-potential anode is a product of The Dow Chemical Company, 1000 Main St., Midland, Mich. . . . or check 7988 opposite last page.)

PETRONATE

(Reg. U. S. Pat. Office)

. . . the oil-soluble petroleum sulfonate for all four major functions . . .

A Emulsification and Dispersion of Liquids

B Dispersion and Wetting of Solids

C Wetting and Dispersion of Liquid-Solid Systems

D Inhibition of Rust and Corrosion

PETRONATE is the general trade name given by Sonneborn to its various types and grades of oil-soluble petroleum sulfonates.

The chart suggests the broad range of uses for this material. A laboratory sample of PETRONATE will help you determine how its many advantages can be put to efficient use in your manufacturing processes.

Check the coupon below indicating the use intended so that we can send you the proper type of PETRONATE.

USES OF PETRONATE

APPLICATION	PRIMARY FUNCTION OF PETRONATE	SECONDARY FUNCTION
EMULSIFICATION AND DISPERSION OF LIQUIDS		
1. Insecticide Emulsions	Emulsifying Agent for Toxicant	Spreading Agent
2. Textile Oils	Emulsifying Agent for Textile Processing Oils	Wetting and Dispersing Agent for Textile Fibers
3. Leather Oils	Emulsifying Agent for Leather Processing Oils	Wetting and Dispersing Agent for Leathers
DISPERSION AND WETTING OF SOLIDS		
4. Rubber Manufacture	Thermo Plasticizing Agent	Increases Dispersibility of Filler
5. Fuel Oil	Keeps Sludge in Suspension	Prevents Segregation of Moisture
6. Printing Ink Manufacture	Aids dispersion of pigment	Reduces Viscosity of Ink
7. Ore Flotation	Flotation Reagent	Selective Wetting Agent
8. Additives for Lube Oil	Acts as Detergent	Inhibits Bearing Corrosion
WETTING AND DISPERSION OF LIQUID-SOLID SYSTEMS		
9. Crude Oil Emulsion Splitting	Reverting Agent for Water-in-Oil Emulsions	Aids in Wetting out Salts and Solids
10. Emulsifiable Solvent Cleaners	Dispersing Agent for Oil and Grease Deposits	Acts as Emulsifying Agent
11. Dry Cleaning Compounds	Linking agent for Water and Solvent	Loosens Dirt Absorbed by Fabric
12. Fat Splitting Process	Dispersing Agent for Solid Fats	Acts as Wetting Agent
INHIBITION OF RUST AND CORROSION		
13. Corrosion Preventive Compounds	Rust and Corrosion Inhibiting Agent	Acts as Moisture Barrier
14. Anti-Freeze Solutions	Rust and Corrosion Inhibiting Agent	Aids in Dispersion of Scale
15. Soluble Cutting Oils	Emulsifying Agent for Mineral Oil	Rust Inhibitor

L. SONNEBORN SONS, INC.
New York 10, N. Y.

White Oil and Petrolatum Division, L. SONNEBORN SONS, INC.
300 Fourth Avenue, New York 10, N. Y.

Please send sample of PETRONATE suitable for use indicated below (circle number corresponding to use in chart above).

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

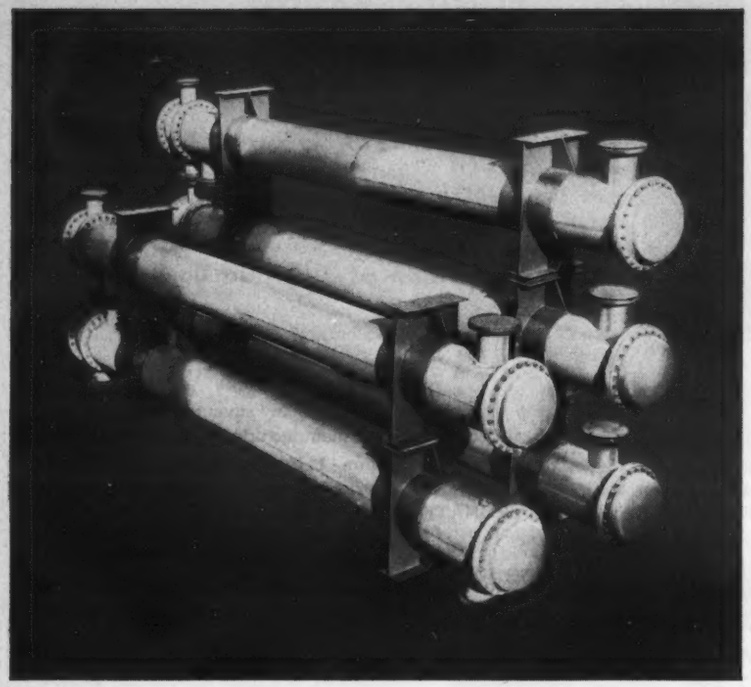
Name_____

Company_____

Address_____

City_____ P.O. Zone_____ State_____

When inquiring check CP 7989 opposite last page



Downingtown-built coolers of Ampco 8 saved 25% on equipment costs

A large chemical company asked if these five coolers could be made of Ampco 8, as well as from another more expensive corrosion-resistant alloy. Because of our successful experience in fabricating vessels and heat exchangers of Ampco 8, Downingtown engineers said, "Yes!" Thus Downingtown experience enabled the customer to save 25% on the cost of this equipment.

Each unit is 20" in diameter x 20' tube length, and of fixed tube sheet construction. There are 282 ¾" O.D. x 12 B.W.G. tubes in each shell. All parts are of Ampco 8, except the bolts and channel covers (which are lined with Ampco 8). Shells and dished heads are ¼" plate, and the channels are centrifugally cast. Units are designed for 150 psi. on both shell and tube sides.

What Downingtown experience can do for you—

Heat transfer equipment designed and built by Downingtown will do a specific heating or cooling job for you with a minimum of maintenance in the field. We are skilled at recommending correct thermal and mechanical designs and the best fabrication methods utilizing the materials you specify. Ask us to quote on your next special job.

DOWNINGTOWN IRON WORKS — Hackney

Downingtown Iron Works, Inc.
Downingtown, Pennsylvania
New York Office: 52 Vanderbilt Avenue, New York 17, N. Y.

HEAT EXCHANGERS • TOWERS • PRESSURE VESSELS • STORAGE TANKS • STEEL AND ALLOY PLATE FABRICATION
Division of: Pressed Steel Tank Company, Milwaukee 14, Wisconsin • Manufacturer of Hackney Products
CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 7990 opposite last page

Safety and resistance offered in aluminum, steel gratings

Gratings and stair treads being offered chemical, oil, and other industries are available in two materials. Stainless steel floor grating is rust-proof, highly resistant to heat and corrosion, and non-magnetic.

Aluminum makes grating and stair treads ideal for use where sparking might be dangerous in certain atmospheres.

(Stainless Steel and aluminum gratings are products of Kerrigan Iron Works, Inc., Dept. CP, 274 Madison Ave., New York, N.Y. . . . or for more information check CP 7991 on handy form opposite last page.)

Chromium carbides show excellent resistance to corrosion . . .

also resist molten metals, plastics, hot glass

Chromium carbides, sintered chromium carbon compounds bonded with nickel, show excellent resistance to chemical attack by strong acids, alkalis, and salts. In addition, preliminary tests indicate good resistance to the corrosive effects of molten metals, hydrogenated coal, plastics, and molten or hot glass.

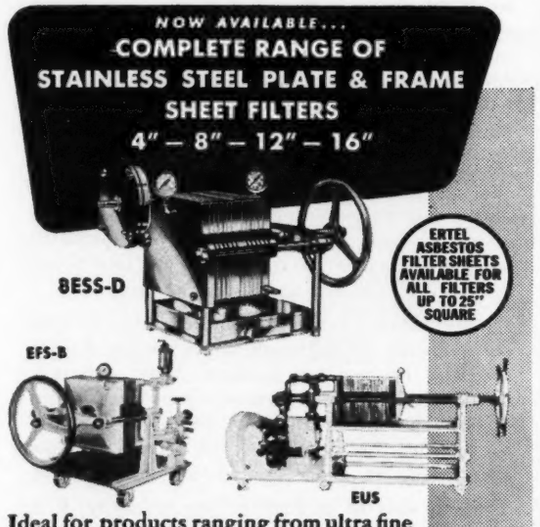
Corrosion rates of one grade of this material in white fuming nitric acid are reported as: 0.00076" per year @ room temp; and 0.030" per year @ 160°F.

Preliminary test results also indicate erosion-resistance of chromium carbides is up to 50 times greater than that of conventional sintered tungsten carbides, or about the same as that found in various cast alloys.

(Chromium carbides are products of Firth Sterling Inc., Dept. CP, 3113 Forbes Street, Pittsburgh 30, Pa. . . . or for more information about manufacturer's product reader may simply check CP 7992 on handy form opp. last page.)



When inquiring check CP 7993 opposite last page



Ideal for products ranging from ultra fine pyrogen solutions to coarse prefiltered bulk chemicals.

Send for Catalog illustrating the complete line of corrosion resistant filtration equipment.

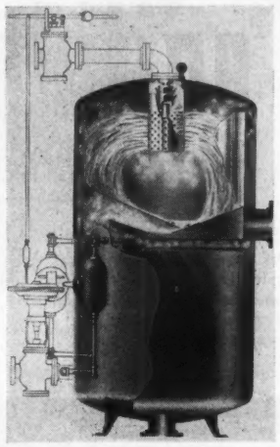
ERTEL ENGINEERING CORPORATION
KINGSTON 3, NEW YORK
Branch Office & Showroom Located in New York City
COMPLETE LINE OF *Liquid Handling Equipment*
ERTEL

When inquiring check CP 7994 opposite last page

Deaerator is all stainless inside — prevents baffles, tank or shell from corroding . . .

unit adjusts self to all loads without springs, mechanical devices, or moving parts

In this recently-developed unit, all surfaces wetted by water undergoing deaeration are stainless steel, eliminating possibility of baffles corroding out. Large cylindrical stainless steel baffle, fully surrounded by steam, prevents contact of sprayed water with outer shell, eliminating corrosion of tank, and cooling of water with possible redissolving of gases.



Cutaway shows two-stage deaeration action of spray and steam

In addition to their all-stainless internals, these deaerators have efficient counter-current, two-stage deaeration action, positive steam scrubbing action, and complete self-adjustment at all loads without springs, mechanical devices, or moving parts of any kind.

(Stainless steel deaerator is a product of L. A. Water Softener Company, Dept. CP, 1007 Air Way, Glendale 1, Calif. . . . or for more information check CP 7995 on handy form which is located opposite last page.)

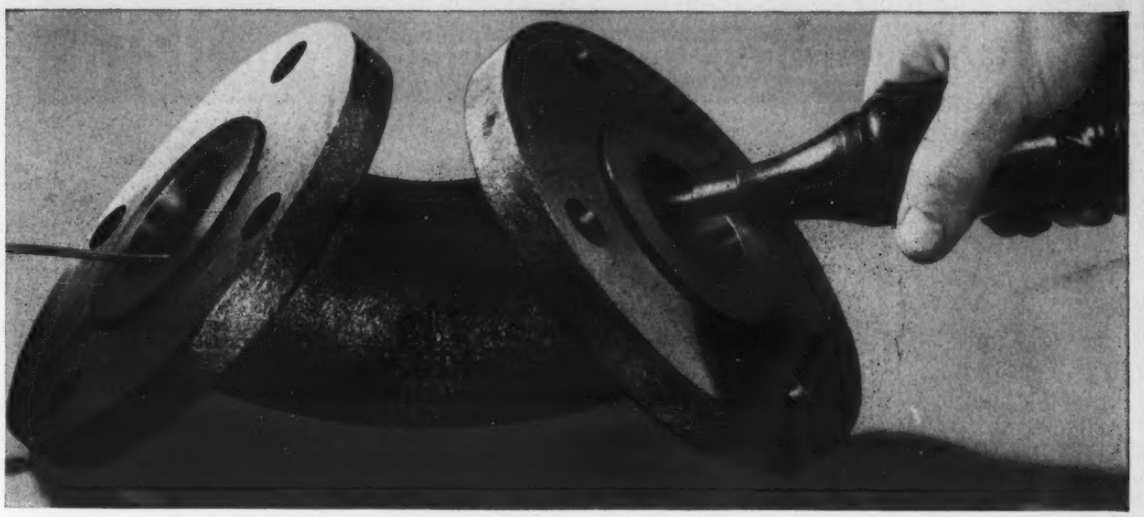
Corrosion Engineer's manual covers basic steps

Necessary basic steps to do a good job in corrosion-proofing activities are described in 24-page Corrosion Engineer's manual. According to manual, these three basic steps should be followed in solving a specific problem: 1) analyze the specific corrosion-proofing problem, 2) set specifications that will meet every aspect of problem, and 3) effect application or construction exactly according to specifications.

Manual also describes cements, membranes, acid brick, and coatings used for corrosion control.

Manual WJK is issued by Nukem Products Corp., Dept. CP, 110-120 Colgate Ave., Buffalo 20, N. Y. When inquiring about manufacturer's product reader may simply specify CP 7996 on handy form opposite last page.

DOW



You can see why

SARAN LINED PIPE

KEEPS SHUTDOWNS TO A MINIMUM

It's made of corrosion-resistant saran pipe swaged into strong, rigid, nonbursting steel. And every piece is spark tested before you buy!

Unscheduled shutdowns are a thing of the past when you use saran lined pipe, fittings and valves to convey corrosive liquids. This modern, trouble-free piping is corrosion resistant . . . forms tight, snug, leakproof joints . . . won't burst under *working* pressures up to 150 psi. And every single piece of saran lined pipe is carefully spark tested by hand to be sure that there are no pinpoint holidays or cracks in its lining. Cast steel lined fittings are available for higher pressures.

Installation costs are surprisingly low with saran lined pipes, fittings and valves, too. They can be cut and threaded in the field with standard pipe-fitter's tools. Their rigidity means few supporting members are needed.

If you want to convey acids, alkalies, or other corrosive liquids at low over-all cost, be sure to investigate saran lined pipe. Contact the Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale 20, Michigan, Department SP528B-1.

RELATED SARAN PRODUCTS

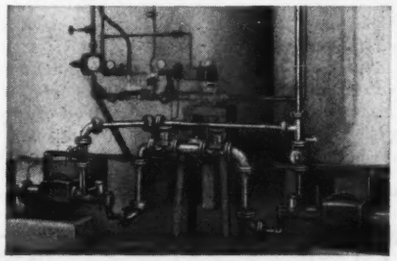
Tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

SOME OF THE MANY INSTALLATIONS USING

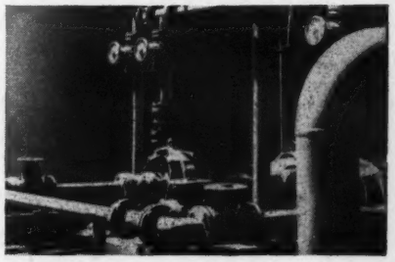
SARAN LINED

STEEL PIPE

Saran Lined Pipe is Manufactured by The Dow Chemical Company Midland, Michigan



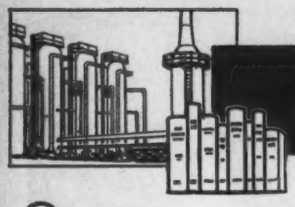
A large Southeastern paper mill uses saran lined pipe to handle corrosive alum solution. It has proved to be an exceptionally satisfactory answer to eliminating unscheduled shutdowns.



This installation of a large Midwest company has conveyed highly corrosive hydrochloric acid for over seven years. The joints have remained as tight and leakproof as new.

you can depend on DOW PLASTICS DOW

When inquiring check CP 7997 opposite last page



processing and engineering data

124a

corrosion control

CORROSION KEYS: Surface Coatings

Data by KARL BENNUNG, President
Chemical Coatings and Engineering Co.

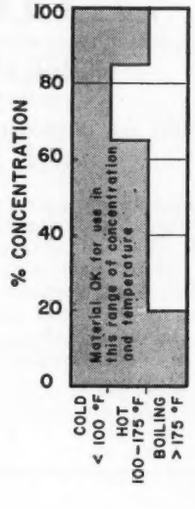
"Keys" by BRUCE FADER and FRANK McELROY
CHEMICAL PROCESSING Editorial Staff

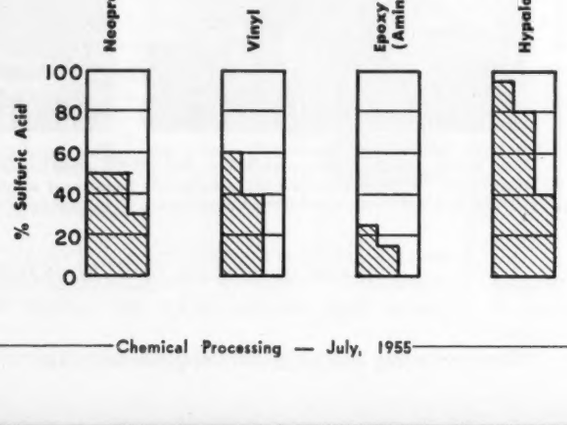
Corrosion data are often presented with vague limits and on dissimilar bases, so that comparison is made difficult and the data's usefulness is reduced. Corrosion Keys© provide a quick and handy method for finding preliminary answers for specific problems. Because each one has the same parameters, comparisons can easily be made, and selection of the best material — commensurate with cost — is made easy.

By their shaded areas, keys show in what temperature ranges coatings based on four commonly used materials will withstand action of six common corrosives in various concentrations.

In these keys, **cold** refers to temperatures below 100°F. **Warm** means between 100° and 175°F. **Hot** temperatures are those above 175°F.

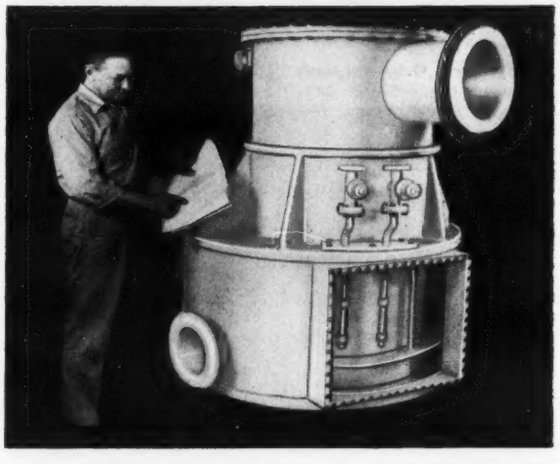
Enlarged key shows by shaded area, that region in which a particular material will withstand the action of aqueous solutions of a specific chemical at various concentrations. Key is divided into three vertical sections which can be judged by inspection. Of necessity, data are fairly general. Other factors such as surface preparation, surface properties and abrasion must also be considered.





agilene®
(POLYETHYLENE)
improved non-corrosive plastics for fabrication of chemical processing equipment
AGILENE AGILIDE
agilide®
(NON-PLASTICIZED)
(POLYVINYL CHLORIDE)

Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE — fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



AGILENE—*high molecular weight, structural grade, rigid polyethylene*—Entirely impervious to attack with hydrofluoric acid solutions and fluorides at temperatures up to 170° F.

The AGILENE scrubber pictured above is 4 feet in diameter by 5 feet high for removing fluorides with a gas flow of 2500 cfm at 1½ p.s.i. Component ducting, valves, and piping are of AGILENE and the entire system is corrosion proof.

A typical Agile fabrication to cut maintenance costs to the bare minimum—to pay maximum dividends on the investment dollar.

American Agile Corporation
Plant and General Offices • 5461 Dunham Rd., Maple Heights, Ohio
Mailing Address, P. O. Box 168, • Bedford, Ohio
DEPT C-1

When inquiring check CP 7998 opposite last page

CUT HERE AND FILE

Chemical-resistance tables on unplasticized PVC

Four-page table covers the resistance of unplasticized PVC to a variety of chemicals. Effect of specific chemicals on weight, tensile strength, and elongation at break is given. For some chemicals the flexural modulus, Rockwell hardness, and heat distortion of the PVC are also given. Information is included on the physical properties of manufacturer's unplasticized polyvinyl chloride.

Engineering Report R-30 is issued by Stokes Molded Products Div., The Electric Storage Battery Co., Dept. CP, Taylor St. at Webster, Trenton 4, N.J. When inquiring specify CP 7999 on handy form opposite last page.

Excellent strength and adhesion exhibited by neoprene lining . . .

flow qualities permit easy application on any surface, plain or irregular

Uses: For surface protection in immersion service in caustic soda and other strong alkalis, salt and brine solutions, acid, alkaline and neutral salt solutions, vegetable oils and greases.

Features: Lining can be applied equally well to irregular shapes and surfaces and plain surfaces. Excellent flow qualities permit easy application by brush, spray, or dip methods.

Description: Lining combines corrosion resistance of neoprene with excellent strength and adhesion. It can be heat- or air-cured to a resilient vulcanized coating which shows resistance to a wide range of corrosives up to 200°F.

Material has long storage life since curing accelerators are packaged separately and are mixed with the lining just prior to application.

(NeoLine neoprene lining is a product of Pennsylvania Salt Mfg. Co., Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. . . . or check CP 8000 opposite last page.)

Comprehensive data on titanium

Titanium, said to be the brightest star on the metal horizon, is covered in detail in 60-page booklet. Extensive information is given on titanium's corrosion-resistance, mechanical properties, along with considerable other pertinent data.

Booklet ADV 617-R is available from Republic Steel Corp., Dept. CP, 3100 E. 45th St., Cleveland 27, Ohio. Specify CP 8001 opposite last page.



...with corrosion-resisting WELD OVERLAY

For West Virginia Pulp & Paper Company, Graver recently completed three pulping digesters 11′ 3″ in diameter by 42′ 9″ over straight shell. To guard against localized corrosion, a portion of the top shell and head plates was overlaid with a succession of solid stainless weld beads.

One of the most serious corrosion problems for the pulping industry in recent years has been the corrosion of carbon steel digesters. Severest damage is generally found in the top head and bottom cone areas. However, the location of these vulnerable areas in a digester depends upon a number of variables, including plant filling and cooking practices. An effective method of protecting against rapid localized attack is suggested in the overlay of a thin corrosion-resistant layer of weld metal. This procedure can be applied both to older vessels and to new vessels. Such protection, while not uncommon in other industries, is unusual in the paper industry. The selection of Graver for this specialized fabrication re-emphasizes Graver's reputation for unexcelled craftsmanship.

GRAVER ***...fabricators in steels and alloys***

GRAVER TANK & MFG. CO., INC.

East Chicago, Indiana

CHICAGO • NEW YORK • PHILADELPHIA • EDGE MOOR, DEL. • CATASAUQUA, PA. • PITTSBURGH • CLEVELAND • DETROIT • TULSA • SAND SPRINGS, OKLA. • HOUSTON • ODESSA, TEXAS • CASPER, WYOMING • LOS ANGELES • FONTANA, CAL. • SAN FRANCISCO

When inquiring check CP 8002 opposite last page

CORROSION KEYS:

Corrosion-resistant Coatings

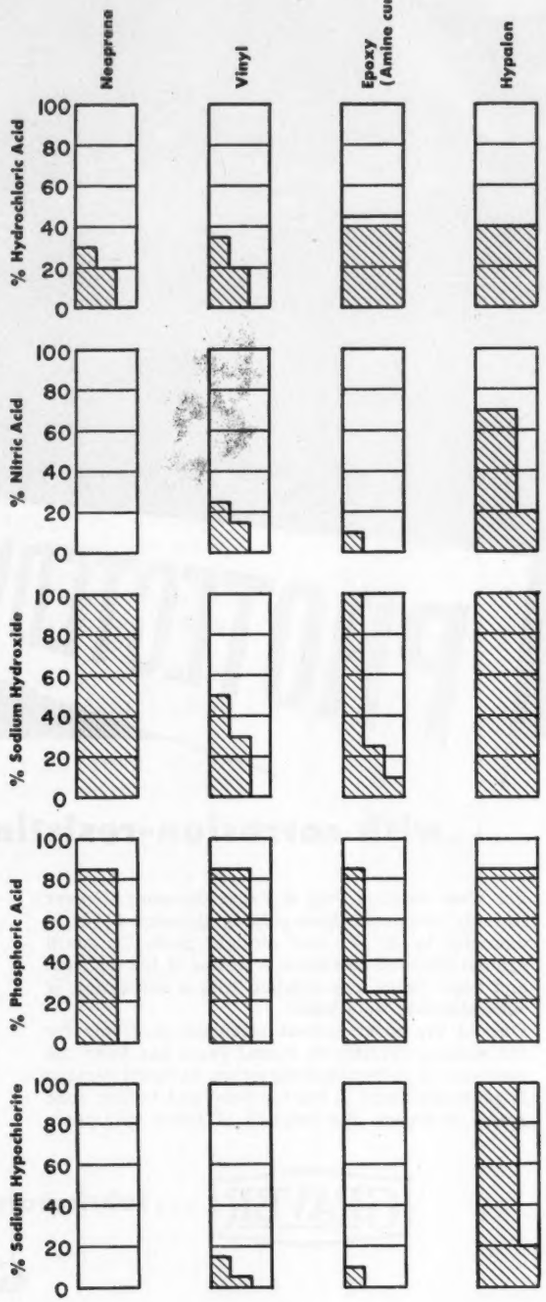
One-part neoprene systems, because of their fortification with resin, have proved excellent in HCl, acetic acid, and in other fume areas where neoprene would not normally be considered. This system is actually the most resistant coating available for fume conditions.

Considerable interest in one-part neoprene is being shown in coating non-metallics such as wood and canvas. Wooden pickling and chemical tanks, as well as wood, canvas, and rope used around plant, can be protected. Wooden box cars can also be protected against moisture and rotting by this coating.

Penetration afforded by the solvent system in one-part neoprene results in good adhesion and neoprene itself is so chemically stable that it imparts excellent resistance to coated material.

Coatings based on epoxy-polyamide show lack of toxicity, increased adhesion, and flexibility, especially when compared to 100% epoxy amine cured systems, to which their chemical resistance is comparable. One interesting use is in rubber and other elastomers, where it provides protection against heat, solvents, oils, and other conditions encountered in belting and drive applications.

This system can be used either clear or pigmented, and with a solids content in the 60% range. Inhibiting primers such as red lead are available.



CUT HERE AND FILE



GRID

UNIT HEATERS

Trouble-free heating service in the...

Major Chemical Plants *since 1929*

...NO Maintenance or Repairs

The reason for this wide acceptance . . .

GRID'S All-Cast construction having similar metals in contact with steam prevents electrolytic corrosion.

GRID'S ability to withstand steam pressures up to 250# P.S.I.

GRID'S low outlet temperatures, proper fan sizes and motor speeds assure delivery of warm comfortable air in ample volume, directly to the spot where it is needed. Maintenance cost conscious management men turn to GRID for relief from the continuous expense of heating failures experienced with ordinary unit heaters. GRID Unit Heaters installed in 1929 are still operating today . . . the only attention needed has been an occasional oiling of the motor. No ordinary unit heater can approach this record.

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AMERICAN CYANAMID
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Get the full story today. Ask for booklet CORROSION IN UNIT HEATERS . . . it's yours upon request.

D. J. MURRAY MANUFACTURING CO.

Manufacturers Since 1883 • WAUSAU, WISCONSIN

REPRESENTATIVES IN ALL PRINCIPAL CITIES

When inquiring check CP 8003 opposite last page

Homogeneous bonding of lead to steel protects tanks from corrosion

A method used extensively in the chemical industry for controlling corrosion is lining of steel vessels with lead. A typical example of how this procedure is used to advantage is shown by a 10-ton vessel recently relined at the Calco plant of American Cyanamid Company, Bound Brook, N.J.

Accompanying photograph shows leadburning in progress on the shell of this vessel. Unit, known as the Light Oil Acid Washer, measures 10′ in diameter, 13′ in height, and has a capacity of 7000 gal.



Light Oil Acid Washer being bonded with lead at American Cyanamid's Calco plant

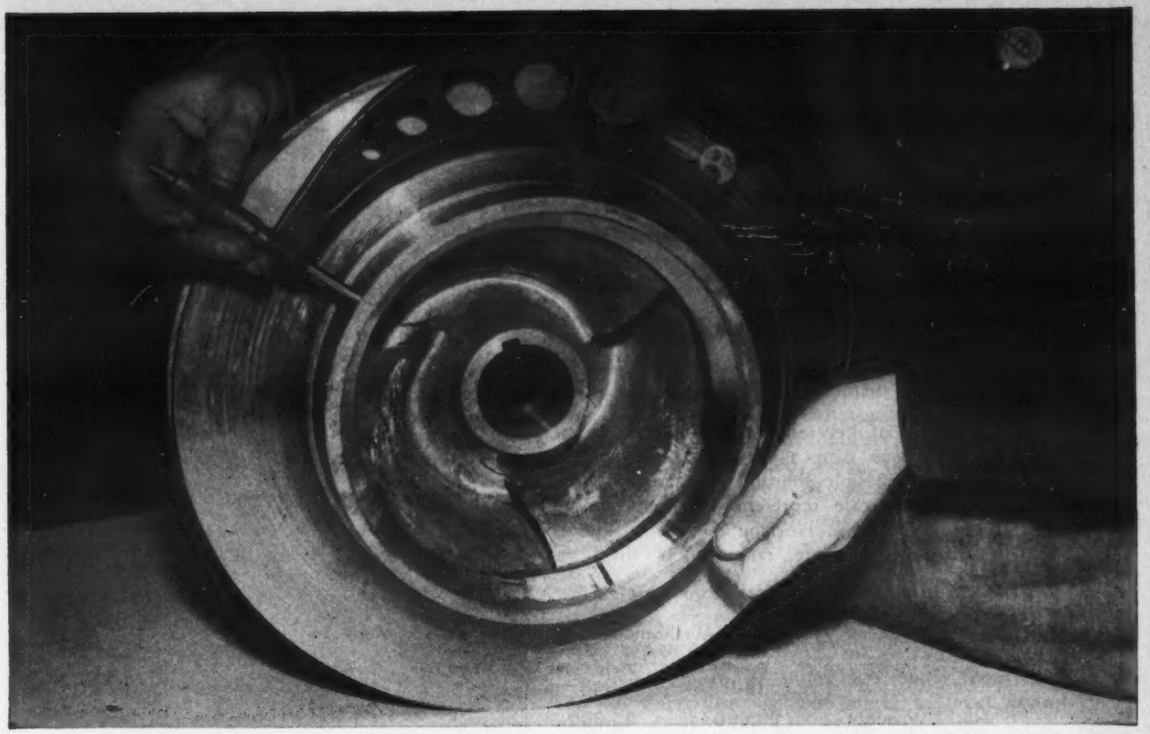
About 20,000 pounds of lead and 100 pounds of tin was used in lining the tank. Vessel is expected to provide many years of uninterrupted service.

When lead is homogeneously bonded to steel, first step is to shot-blast or sand-blast the surface to remove rust and mill scale. Metal is then pickled with sulfuric or hydrochloric acid to remove any remaining dirt, grease, or oxide film. Acid is removed by washing with water.

Next, a bonding agent is brushed on and heat applied with torches. When the steel reaches approximately 600°F, bonding agent melts. It is then rubbed with steel wool to assure a good coating. Excess bonding agent is removed with a cloth. This leaves a very thin coating of solder or of lead (depending on which is specified) on the surface. Steel is now ready for the lead coating to be applied.

About an ⅛th inch coating of lead is applied to the steel, using lead burning bar and a torch. This layer is scraped to remove any dirt or oxides and then additional layers of lead are added as desired.

(For more information on leadburning contact Federated Metals Div., American Smelting & Refining Co., Dept. CP, 120 Broadway, New York 5, N. Y. Check CP 8004 opposite last page.)



Before Cavitation Strikes!

A large pump manufacturer discovers a way to lengthen service life with Inco-Cast Monel

This Inco-Cast Monel impeller is getting a final check before being delivered to the Navy for shipboard use.

Aboard ship, the first-stage impeller of a centrifugal condensate pump wages a constant fight against cavitation-erosion.

Cause of Cavitation Known

Pumps operate at about 28½ inches vacuum with low suction submergence at a temperature near boiling, forcing condensate into deaerating feed tanks against heads as high as 280 feet. Under these conditions, an impeller is subject to cavitation-erosion.

Sudden changes in ship's power change normal capacity and submergence . . . throwing the system into a severe cavitation-erosion condition. The near-boiling condensate erupts into steam, forming tiny bubbles. Flung at high speed with the condensate, these bubbles collapse against the first stage impeller resulting in impact shock pressures which scour the metal away and impose a water hammer effect on the sidewalls or shrouds.

As metal goes, down goes efficiency of the entire system.

Cast Monel Proves Solution

Worthington Corporation finds that Inco-Cast Monel impellers last longer than bronze in this service. Besides standing up against erosion, Monel's greater strength resists bulging of the sidewalls, thereby preventing fatigue failure which sometimes occurs to shrouds of bronze impellers.

Because condensate pump impellers necessarily have large diameters, narrow waterways, thin shroud sections, and smooth spiraling vanes, Worthington has them cast by Inco.

They also find that with Cast Monel, the impeller (and hence system) efficiency stays high over a greater percentage of the life of the impeller. Thus Cast Monel provides *both* longer life and greater average efficiency.

New Booklet Offered

Do you want to know more about how Inco-Cast Monel® resists cavitation and other destructive conditions? Then write for our new booklet, "Cast to Outlast."

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK

Inco Castings . . . *Sand, Centrifugal, Precision*

When inquiring check CP 8005 opposite last page

CORROSION KEYS: Aluminum-bronze Alloys

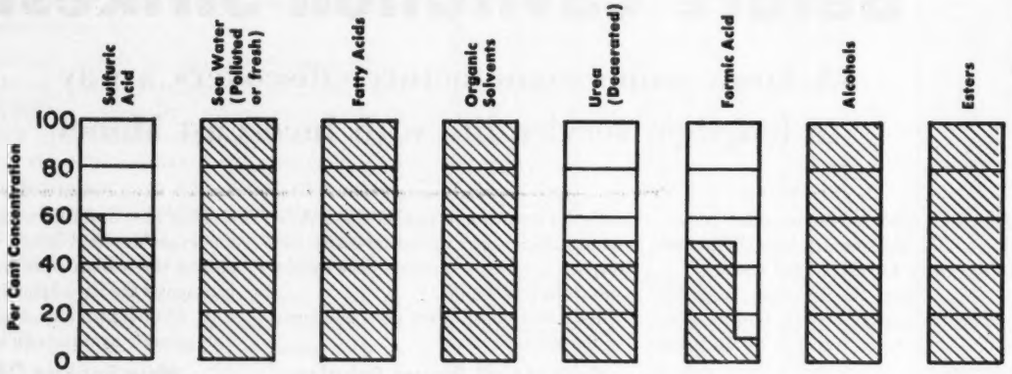
Data by I. S. LEVINSON
Ampco Metal, Inc.

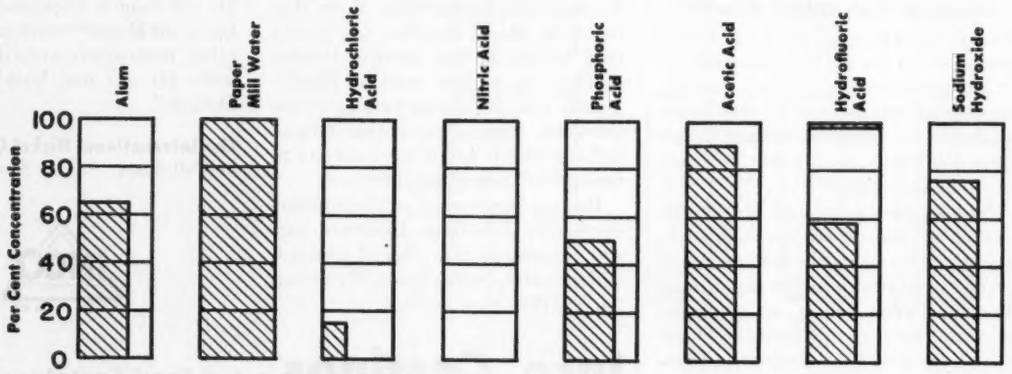
Shaded areas of keys show aluminum-bronze alloys, known as Ampco Metal, should be considered as a possible solution to corrosion problems. Vertical scale represents per cent concentration of corrosive. Horizontal scale is divided into three temperature ranges: left third for <100°F; center, 100-150°F; right third above 150°F to BP of liquid.

Ampco metals are based on copper and contain 7½ to 11% aluminum and 2 to 4¼% iron. A number of compositions are available.

Mechanical Properties of Ampco Metal

	Tensile (psi)	Yield Point (psi)	Elongation (%)	Reduction in Area (%)	Hardness (BHN)
Wrought	80,000	35,000	40	40	150
Cast	70,000-100,000	35,000-65,000	10-40	10-40	120-200





CUT HERE AND FILE

STOP Corrosion with...

Van-Cor

PLASTIC PIPE, FITTINGS AND FABRICATIONS



★ Both Chemically Resistant and Impact Resistant Types

★ Half the Weight of Aluminum, with High Tensile Strength

★ Readily Formed, Machined, Drawn, Molded or Welded

AVAILABLE FORMS

SHEETS... 1/32" through 1". PIPE... ½" through 8" diameter (10 or 20 ft. lengths). ROUND BARS... ⅜" through 5" diameter (10 ft. lengths). WELDING ROD... ⅛" and 5/32" diameter.

TYPICAL APPLICATIONS

A rigid non-plasticized polyvinyl chloride, Van-Cor is fabricated into such products as: Ducts, Hoods, Chemical Tanks, Tank Liners, Plating Racks, Fume Stacks and Piping.

WRITE FOR ILLUSTRATED BULLETIN, SPECIFICATIONS, AND NAME OF NEAREST DISTRIBUTOR

INDUSTRIAL DIVISION OF
COLONIAL PLASTICS MFG. CO.

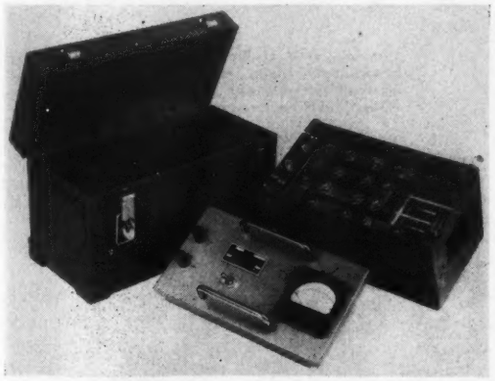
SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
2685 EAST 79th STREET • CLEVELAND 4, OHIO

When inquiring check CP 8006 opposite last page

Storage batteries containing KOH as electrolyte are protected by epoxy coating . . .

damage from accidental leakage is forestalled

Problem: Although storage batteries produced by Saft Corp. of America, Lodi, N.J., are hermetically-sealed, active nature of the reaction between aluminum and caustic potash made necessary a maximum-resistance coating to protect aluminum battery cases from accidental leakage of electrolyte. These batteries are long-lived and must perform under severe conditions of corrosion and exposure to heat, oil, dirt, and chemicals. And since batteries were to be painted after fabrication, an air-drying protective coating was essential.



Epoxy coatings enable use of lightweight aluminum

Solution: Saft Corp. tested many coatings in a 40% potassium hydroxide solution at 140°F for a period of six weeks, and finally approved a system of catalyst-cured, unmodified, epoxy formulations. System consists of one coat of red oxide primer and two coats of a light gray epoxy.

These coatings are applied with conventional spray equipment, allowing four hours between coats. After an overnight dry, batteries can be handled and packed, although several days' curing is required before full resistance is achieved.

Results: In the original accelerated tests these coatings showed no sign of failure through permeability, loss of adhesion, discoloration, softening, or blistering. When case and batteries were stripped, no trace of corrosion could be found on metal.

Additional tests showed that coating system was not affected by fuel oil, gasoline, jet fuel, high operating temperatures, or highly corrosive atmospheres.

As a result of these tests, Saft Corporation is able to utilize the favorable weight properties of aluminum.

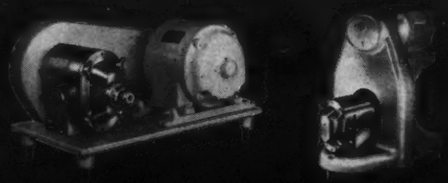
(Lankote 1000 Series epoxy coatings are products of Lankote Div., J. Landau Co., Dept. CP, 221 Wooster St., New York 12, N.Y. . . . or for more information check CP 8007 on handy form opposite last page.)

IS PUMPING *Corrosive Solutions* A PROBLEM IN YOUR PLANT ?



STANDARD PUMP
Available in five basic sizes.

VENTED PUMP
Easily adjusted for any back pressure.



V-BELT TYPE UNIT

WAUKESHA HiGH BOY
Variable set capacity model, V-belt driven.



WAUKESHA PUMP with U.S. Varidrive.

WAUKESHA PUMP with Reeves Motodrive.



PORTABLE UNIT

STATIONARY UNIT
Adjustable legs on all platform models.

SOLUTION—If so, select an all-purpose, corrosion-resistant Waukesha P.D.* Sanitary Pump. Furthermore, no product damage . . . no aeration . . . no pulsation . . . but smooth product flow!

Ideal for pumping these typical corrosive solutions—acetate solvents, ammonia chloride, aniline dyes, barium chloride, butyric acid, calcium phosphate, chlorinated water, copper sulphate (water solution), stearic acid, tartaric acid, toluol.

Handles equally well these materials—starch paste, alcohol, cold creams, pharmaceutical products, synthetic hormones, cellulose, film dope, ink, lard, liquors, paints and varnishes, adhesives, syrups, molasses.

Why WAUKESHA

Corrosion-Resistant—Pump fabricated from required corrosion-resistant metal to meet your needs: metal does not react chemically with product—protects pump from wear . . . does not contaminate product.

Positive Displacement—Provides a smooth, virtually non-pulsating positive flow.

Sanitary—Quick and easy to disassemble, clean, sterilize, and reassemble. No recesses. No hard to get at crevices. Smooth, highly polished metal surfaces.

No Leakage—Using a John Crane Rotary Seal, designed to completely seal out air and completely seal your product in, reduces your pump leakage problems to a minimum.

Dependable—Quality construction. Trouble-free operation. Low maintenance expense.

Many Satisfied Users—Names supplied upon request for your review.

Note: Inlet and outlet ports from 1" to 3" diameter. Delivery capacities from 1/10 to 100 gal. per min.

Write For Full Information—Waukesha Foundry Company, Dept. 7P, Waukesha, Wisconsin.

*Positive Displacement

Waukesha Foundry Company

WAUKESHA—the Forward Look in Pumps. Yesterday, Waukesha Pioneered the Sanitary P.D. Pump. Today, Waukesha Pioneers the Improvements.

When inquiring check CP 8008 opposite last page

Chemical Resistance of Polyethylene Resins

Adapted from information supplied by
Durethene Corp., Chicago, Ill.

Resistance of polyethylene to attack of various chemicals should not only be of use to the design and process man, but also be of inestimable value to users of polyethylene bags and liners for packaging chemicals.

In the following list an "x" indicates that polyethylene will withstand the action of the chemical at the temperature and concentration specified.

(Information digested from "A Guide to the Application of Polyethylene Resins in Chemical Environments" issued by Durethene Corp., Dept. CP, 1859 S. 55th Ave., Chicago 50, Ill. When inquiring specify CP 8009 on handy form opposite last page.)

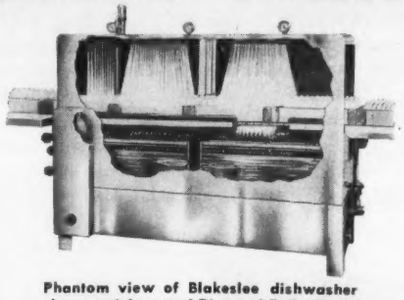
Chemical	Resists 25°C	Attack At 60°C
Acetaldehyde	x	
Acetic acid (up to 10%)	x	x
Acetic acid (glac. and anh.)		
Acetone	x	
Alcohols		
Alum	x	x
Ammonia and compounds	x	x
Amyl acetate and chloride		
Aniline and compounds		
Aqua regia		
Aromatic solvents		
Benzoic acid	x	x
Boric acid	x	x
Butyl acetate		
Calcium hypochlorite	x	
Carbon disulfide		
Carbon tetrachloride		
Carbonic acid	x	x
Chlorosulfonic acid (100%)		
Chromic acid (80%)	x	x
Citric acid	x	x
Cresylic acids (50%)	x	x
Cyclohexane		
Dioxane (100%)	x	
Ether		
Fatty acids (>C_6)		
Formaldehyde (40%)	x	x
Formic acid	x	x
Glycerine	x	x
Glycols		
Halogens		
Hydrobromic acid (50%)	x	x
Hydrochloric acid	x	x
Hydrocyanic acid	x	x
Hydrofluoric acid (48%)	x	x
Hydrofluoric acid (75%)	x	
Hydrogen peroxide (3%)	x	x
Hydrogen peroxide (30-90%)	x	
Hydrogen sulfide, dry gas	x	x
Inorganic salts (in general) and their aqueous solns	x	x
Ketones		
Lactic acid (<90%)	x	x
Lauryl sulfate		
Maleic acid	x	x
Mercury	x	x
Naphtha	x	
Naphthalene		
Nitric acid (<20%)	x	x
Nitric acid (50%)	x	
Nitric acid (95%)		
Nitroethane and nitromethane	x	
Nitropropane		
Oils, animal, vegetable, mineral		
Oxalic acid	x	x
Ozone		
Paraffin wax	x	
Perchloric acid	x	x
Phenol (94%)	x	
Phosphoric acid (30%)	x	x
Phosphoric acid (85%)	x	
Silicic acid	x	x
Sodium hypochlorite	x	
Starch	x	x
Sulfur	x	x
Sulfuric acid (<50%)	x	x
Sulfuric acid (70%)	x	
Sulfuric acid (96%)		
Sulfurous acid	x	x
Tallow	x	
Tannic acid (10%)	x	x
Tartaric acid	x	x
Water (distilled)	x	x
Yeast	x	

CUT HERE AND FILE

Another Job Done Better By

Corrosion-Resistant

DIAMOND ROLLER CHAINS



Phantom view of Blakeslee dishwasher shows stainless steel Diamond Roller Chain used on conveyor and standard Diamond Roller Chain from speed reducer to conveyor.

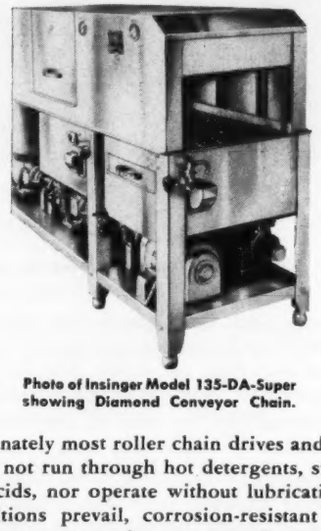


Photo of Insinger Model 135-DA-Super showing Diamond Conveyor Chain.

Fortunately most roller chain drives and conveyor systems do not run through hot detergents, steam filled air, food acids, nor operate without lubrication. But if such conditions prevail, corrosion-resistant Diamond Chains for conveyor and power transfer purposes are available for successful application.

Diamond Engineers have met and found solutions to hundreds of problems of this kind and can help you select the correct pitches and attachments to meet your requirements.

DIAMOND CHAIN COMPANY, Inc.

Where High Quality is Traditional

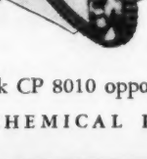
Dept. 411, 402 Kentucky Ave., Indianapolis 7, Ind.

Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under heading CHAINS or CHAINS-ROLLER



New Catalog 754, Stock Roller Chains and Sprockets, mailed on request

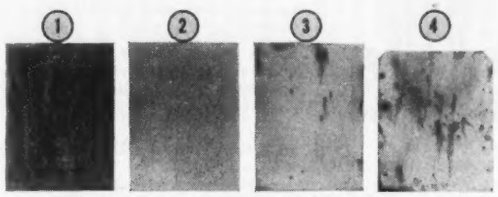
DIAMOND  ROLLER CHAINS

When inquiring check CP 8010 opposite last page

No pores or cracks develop as chromium is plated directly on steel . . .

corrosives can't come in contact with surface being protected

Production plating process deposits a chromium plate which provides better resistance to corrosion than conventional chromium plating. Called Crack-Free Chromium, plate is deposited free of any structural imperfection that would allow corrosive materials to come in contact with underlying surface being protected. As a result, it can be plated directly on steel, without necessity for an undercoat of nickel or copper and nickel.



Salt spray results — 0.0003" chromium directly on steel: 1) conventional, 24-hr exposure; 2) Crack-Free, 24-hr exposure; 3) Crack-Free, 100-hr exposure; 4) Crack-Free, 175-hr exposure

Other desirable properties of deposit produced include low coefficient of friction, excellent adhesion, a non-galling surface, and superior ductility as compared to conventional chromium finishes. Deposit has an attractive light gray matte appearance. It can be readily buffed to a high luster.

Chromium-plating method uses a special chromic acid bath having automatic regulation of catalyst concentration. Bath is prepared by dissolving proper amount of single compound, Unichrome SRHS Compound CF-500, in water. Close temperature control is necessary.

(Crack-Free chromium-plating process is a development of United Chromium, Incorporated, Dept. CP, 100 East 42nd Street, New York 17, N.Y. Check CP 8011 opposite last page.)

Acid-proof lining, construction

Flexon, a rubber-base thermoplastic sheeting for application over a prepared surface to protect that surface and underlying structure from deterioration by corrosives, is described in four-page brochure. Installation is relatively simple. Procedures are included in the discussion.

"Flexon Acid Proof Construction" is issued by W.J. Beringer Co., Dept. CP, PO Box 925, Dayton 1, Ohio. Specify CP 8012 opposite last page.

What's **different** about this **VALVE?**



The main thing is, it was designed and built for the chemical industry by a company which has been living with the liquid-handling problems of the process field for more than 30 years.

It is not just a globe valve made of corrosion resistant materials. Construction features are based on what we know happens in chemical plants. Like LaBour Pumps, LaBour Valves are built for *dependable* service—the lowest cost service you can buy.

Ask for your copy of Bulletin H-2.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

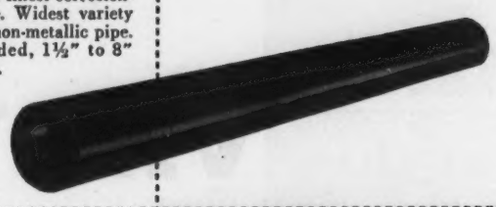
LABOUR VALVES

THE LABOUR COMPANY, INC. ★ ELKHART, INDIANA, U.S.A.

When inquiring check CP 8013 opposite last page

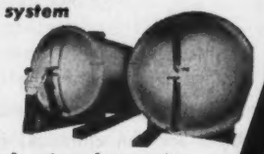
OLDEST PLASTIC PIPE STILL "TOPS"

ACE hard rubber . . . now more than a century old . . . long the finest corrosion-resistant pipe available. Widest variety of fittings of any rigid non-metallic pipe. Sizes ¼" to 8" threaded, 1½" to 8" flanged. *Bulletin CE-51.*



LIFE-TIME ACID STORAGE TANKS

Rubber-lined by ACE 2-layer system

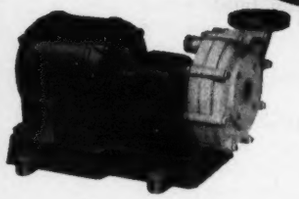


Economical, universal protection against all alkalis, metallic salts, practically all inorganic acids, hydrochloric acid any strength, sulphuric to 50%, nitric to 20%, phosphoric to 75%. Good to 160 deg. F. . . . sometimes higher. Soft rubber interlayer aids shock resistance.

ACE chemical equipment

"more resistant to more corrosives"

Complete line of rubber and plastic processing equipment . . . eight basic materials for pipe and fittings, valves, pumps, tanks, molded parts, utensils, etc.



ACE "WAM" . . . THE FINEST

Non-metallic Acid Pump

On job after job, this 80-gpm. centrifugal pump has earned highest praise. Hard rubber casing and impeller, Hastelloy C shaft. Handles nearly all corrosives. Mechanically simple, trouble-free. *Bulletin CE-55.* Larger ACE pumps available.



NEED SPECIAL FITTINGS, COVERS, TANKS, PARTS?

If you want life-time corrosion protection for special parts needed in quantity . . . we may save for you by molding them of ACE hard rubber or plastics to your most exacting requirements. Our facilities among world's largest. Ask for recommendations.

ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY

93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 8014 opposite last page

Combine Al and $SrCrO_4$, make rust-stopping pigment . . .

more effective than primer or aluminum separately

Uses: As a paint ingredient.

Features: Product combines hiding power, reflectivity, protection given by aluminum pigment with rust-inhibitive properties of strontium chromate.

Description: Paint made with this product is expected to have excellent rust-inhibitive properties, especially where salt water exposure is involved. While a single coat is not as good as a primer followed by a coat of aluminum, it is better than a single coat of either the primer or aluminum itself.

(Rust-inhibitive aluminum pigment is a development of Reynolds Metals Co., Dept. CP, 2500 S. Third St., Louisville, Ky. Check CP 8015 opposite last page.)

For corrosive services — structural shapes in plastic . . .

I-beams, angles, and channels are available

Glass-reinforced, polyester resin plastic angles, channels, and I-beams are available for use in corrosive services. The structurals

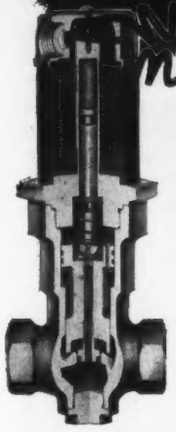


are strong, lightweight, and corrosion-resistant throughout. Solid construction allows shapes to be drilled as required for usage without exposing any non-resistant material.

(Plastic structural shapes are products of Heil Process Equipment Corp., Dept. CP, 12901 Elmwood Ave., Cleveland 11, Ohio . . . or for more information check CP 8016 opposite last page.)

Atkomatic SOLENOID VALVES

Pressures from 0 to 5,000 psi



RUGGED, DEPENDABLE, TIGHT CLOSING

⅛" to 3", Full Ported, Packless Construction

- **Stainless Steel or Bronze** — For gases, liquids, or steam.
- **Smooth, Shock-Free Action** assured by controlled rate of closing.
- **Stick-Free Operation** over a wide temperature range, even with highly viscous fluids.
- **Simple Design** assures a minimum of maintenance. Packless construction with few moving parts. All parts can be changed without removing valve from line.
- **Many Extra Features** available on request.

Write for more information on Atkomatic electrically-operated valves. Specify CP-2.

FREE BULLETIN

ATKOMATIC VALVE COMPANY, INC.

545 West Abbott Street, Indianapolis 25, Indiana

When inquiring check CP 8017 opposite last page

WHAT PIPE JOINT COMPOUND WOULD YOU SPECIFY TO HOLD . . .



Tacky enough to hold on to any type of surface

PERCHLORETHYLENE, TOLUENE, "FREONS"®, ACETIC ANHYDRIDE?

Leak Lock joint compound, with five years use in the chemical, refrigeration and aircraft industries, may be the answer to your "unsolvable" leaking joint problems.

Leak Lock has other unusual chemical properties . . . great adhesion and flexibility. It will resist almost everything except lower alcohols and caustic solutions. Ask us about your joint compound problems and request a sample.

Leak Lock

HIGHSIDE CHEMICALS COMPANY

16 COLFAX AVENUE, CLIFTON, N. J.

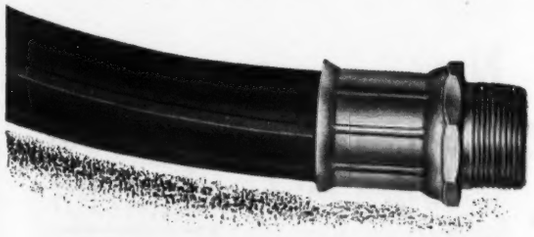
When inquiring check CP 8018 opposite last page

Two hoses for your tough jobs



Corrosion-proof!

You get the advantages of a Teflon® compound in flexible hose form with FLUORO-FLEX*-T Hose and Assemblies. Chemically inert and with 304 stainless braid, the hose can handle all acids and all caustics in any concentration . . . all other chemicals . . . all gases and vapors . . . steam . . . synthetic oils and fuels . . . foods . . . at any temperature from −100°F to +500°F and up to 1000 psi. Available up to 1¼" I.D.



Solvent-proof!

RESISTOFLEX SUPER-SOLVENT HOSE makes the ideal transfer hose for water-insoluble chemicals . . . especially for dry-cleaning fluids. It has a compar tube which is wholly unaffected and impermeable to hydrocarbon solvents of even the most active type which can attack ordinary elastomeric compounds. Available up to 1½" I.D.

Write for Bulletin and data sheets.

*®DuPont trade mark *Resistoflex trade mark*

RESISTOFLEX

CORPORATION • Belleville 9, N. J.

P.S. Mfrs. also of TEFLON, KEL-F and FLUOROTHENE rods, sheets, tubes, mechanical parts, and laminated pipe.

When inquiring check CP 8019 opposite last page

Application information on titanium tubing

Up-to-date information on fabrication of unalloyed titanium tubing is presented in eight-page bulletin. Subjects covered include heat-treating, pickling, welding, brazing, and machining. Included is a section on applications for titanium tubing.

Another section on corrosion resistance gives details on titanium's behavior with many other common reagents. Three forms of tubing are listed, and sizes available are covered.

Bul 43 is available from Superior Tube Co., Dept. CP, 1512 Germantown Pike, Norristown, Pa. When inquiring specify CP 8020 on handy form opposite last page.

Resists hot sulfuric, other oxidizing chemicals . . .

alloy contains 40% nickel and 21% chromium

Uses: Applications for this alloy are expected to be as follows: in tubular heat exchangers, sulfuric acid pickling operations, and in the petroleum and pulp and paper industries.

Features: Alloy is more resistant to hot sulfuric, sulfurous, and phosphoric acid solutions than the common stainless steels. Chromium content is sufficient so that when fortified with nickel, the alloy is capable of resisting a wide variety of oxidizing materials.

Description: Alloy contains about 40% nickel, 21% chromium, 3% molybdenum, 1.75% copper, 31% iron, and small amounts of manganese, silicon and carbon.

(Nionel high-nickel alloy is a product of The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N.Y. . . . or for more information check CP 8021 on handy form which is located opposite last page.)

CORROSION ATTACKS EVERYWHERE!

but



DEL PROTECTIVE COATINGS *STOP* CORROSION!

Just as missile NIKE has become a guided protection in America's first line of defense, DEL Protective Coatings offer guided protection from the deteriorating attack of CORROSION, the costly enemy fighting industry today.

DEL Protective Coatings and DEL Synthetic Rubber Caulking Compound offer degrees of protection never before achieved.

At this very moment DEL Protective Coatings are waging *war against Corrosion,* caused by: *ACIDS, ALKALIES, WATER, OILS, HIGH HEAT, WEATHER, SOLVENTS, ABRASION.*

PROTECT YOUR PLANT with DEL

Vinyls, Acrylics, Synthetic Rubber, Epoxys, Silicones, Phenolics and other Plastic Resin Coatings and Caulking Compounds.

WRITE TODAY. DEL Corrosion Engineers will be happy to make recommendations to counterattack YOUR individual corrosion problems. New 12 page descriptive booklet on DEL Protective Coatings and color card available on request.

DEL PROTECTIVE COATINGS

There is a DEL PROTECTIVE COATING for every industry!

DAVID E. LONG CORP.

220 East 42nd Street, New York 17, N. Y.
MUrray Hill 2-8598

When inquiring check CP 8022 opposite last page



WOW!

You pay no premium for Ampco* Centrifugal Pumps — the pumps that resist corrosion, erosion, and are easily adapted to changing demand

First of all, you can get an Ampco Centrifugal Pump in any alloy you want, with high efficiencies, to give you the maximum resistance to corrosion and erosion your process requires.

You save on power too, because Ampco Pump efficiencies remain high under the most adverse conditions. There are no unstable curves in the Ampco Pump family.

And, if you're faced with changing demands, and you have to run your pump "off rating," an Ampco Pump will fulfill your conditions. You get a pump that saves you money — money on shaft breakage, bearing failures, seal breakage, fretting, etc.

Here's why! Ampco Centrifugal Pumps give you numerous combinations. You can get the exact shaft you need, including standard, heavy, extra-rigid and two-piece designs.

You can select the bearings you want — sealed, replenishable grease, or oil-lubricated, single and double widths.

You can choose your shaft seals — inside or or outside mechanical seals; internal, external, or flushing-packed stuffing boxes.

You can pick the pedestal height and type of impeller you want.

And here's another saving — you don't have to buy a new pump when your conditions change. Thanks to the versatility of Ampco Centrifugal Pump design, you can make modifications in the field — quickly and inexpensively.

It pays to use Ampco Centrifugal Pumps in your tough spots. Speeds — 1750 and 3500 rpm. Capacities to 600 gpm. Heads to 300 ft. Write for latest literature.

*Reg. U. S. Pat. Off.

AMPCO METAL, INC.
Dept. CP-7
Milwaukee 46, Wisconsin
West Coast Plant • Burbank, California

When inquiring check CP 8023 opposite last page

For caustic handling — special packing

A mechanical packing has been developed exclusively for pumps handling liquid caustics. It can be used on stainless steel or chrome-plated shafts and forms a tight seal against such strong alkalis as sodium, potassium, barium, ammonium, or magnesium hydroxides. Method of treating individual strands of pure Chrysolite Canadian asbestos with a Teflon suspensoid immunizes packing against alkalis and prevents it from seizing or scoring shafts.



Packing is made of Teflon-treated asbestos

(White-Lon Style 322 packing for caustics is a development of A. W. Chesterton Co., Dept. CP, 2 Ashland St., Everett 49, Mass. . . . or check CP 8024 opp. last page.)

Manual on copper and alloy specs

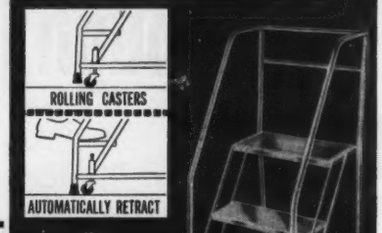
Latest copper and copper-alloy specifications are contained in tabbed, easy-to-use, 24-page reference manual. Two sections are presented: first is a list of the most generally used alloys made by the company, together with applicable specifications of agencies; second section lists specifications in numerical order with a brief description of material as to alloy, grade, type, temper, anneal, etc.

Publication B-34R is available from The American Brass Co., Dept. CP, 414 Meadow St., Waterbury 20, Conn. Specify CP 8025 opposite last page.

NEW... ALUMINUM Safety-Step LADDERS

LIGHT
STRONG
NON-CORROSIVE

1 TO 4 STEPS



Sturdy Ballymore Safety-Step Ladders are now available in 7 new feather-weight, non-corrosive aluminum models . . . for average work levels up to 8' high. Ladders roll easily on ball-bearing casters . . . lock automatically to floor when you step on. All-welded construction gives maximum strength.

Write today for free catalog sheet to Ballymore Company, Wayne 10, Pa.

Ballymore SAFETY LADDERS
BALLYMORE LADDERS

When inquiring check CP 8026 opposite last page

New corrosion-control "tool" . . . sprayable plastisol



Any metal surface that can be sprayed and uniformly baked can now be protected against severe, corrosive conditions with **Unichrome Coating 5300** —the first practical spraying type vinyl plastisol.

Unichrome Coating 5300 offers continuous, seam-free and pore-free protection against acids, alkalies, water, salt solutions, and many other corrosives. It levels surface irregularities and provides substantially greater film thickness, features which are particularly important in coating surfaces that are not smooth. The coating is resilient, resists abrasion, chipping, cracking. *Dry film thicknesses up to 20 mils can be obtained in one coat.* Send for Bulletin VP-1.

UNICHROME Trade Mark **COATINGS FOR METALS**

UNITED CHROMIUM DIVISION • Metal & Thermit Corporation
100 East 42nd St., New York 17, N.Y. • Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

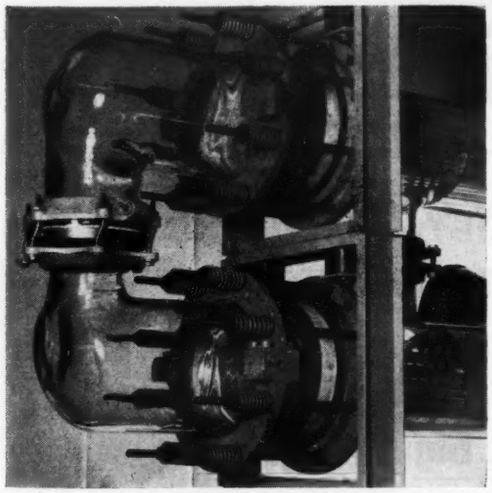
When inquiring check CP 8027 opposite last page

Corrosion-resistant throughout, shell and tube heat exchanger is made of glass . . .

working parts resist attack by all acids except hydrofluoric

Production of a glass shell and tube heat exchanger which is virtually impervious to corrosion has been announced. Unit was developed especially for the processing industries where chemical-resistance and product purity are primary considerations. Operational flexibility is assured by the 50 sq ft-capacity unit because working parts resist attack by all acids except hydrofluoric.

Main body of exchanger is standard 6" Pyrex-brand glass pipe, while the 26 tubes are lengths of ¾" thin wall Pyrex-brand glass tubing supported every six inches by baffle plates. Header assembly of Teflon and high-alumina ceramic is held in place by a Monel retainer ring and steel flanges and springs coated with epoxy resin.



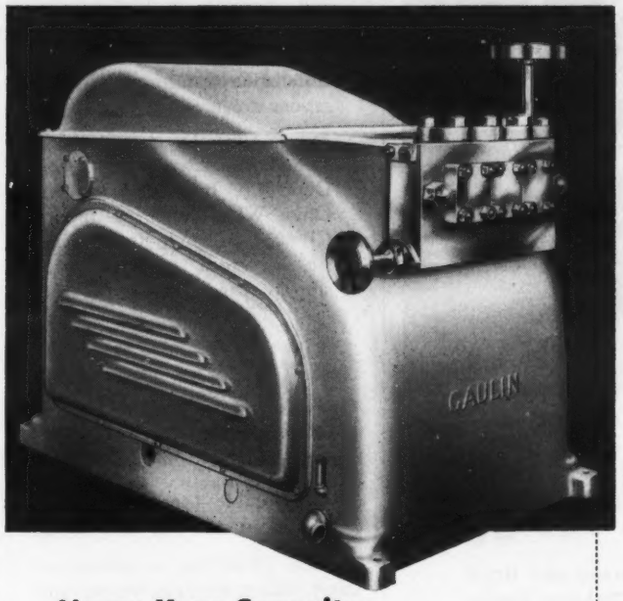
Header assembly of exchanger is of high-alumina ceramic and Teflon. It is held in place by a Monel retainer ring and steel flanges and springs coated with epoxy resin

Compact unit requires installation space measuring only 9 x 13½" x 12'. Modular sections can be mounted either horizontally or vertically in any combination of series and/or parallel flow.

Light-walled tubes have a conductivity coefficient, h, of 260 Btu/hr/sq ft/°F and overall values, U, have been measured up to 195 Btu/hr/sq ft/°F in water-to-water tests. Operating temperatures to 375°F are possible on the shell side and 200°F on the tube side, while operating pressures can be as high as 20 psi.

(Pyrex-brand glass heat exchanger is a product of Plant Equipment Sales Dept., Corning Glass Works, Dept. CP, Corning, New York . . . or for more information check CP 8028 opposite last page.)

There's a GAULIN Triplex Pump for every job



With Maintenance-Saving Horizontal Design Stainless Steel Construction

For Transfer, Metering, Spray Drying

A Gaulin Triplex Pump is a rugged, heavy-duty machine built to minimize operating, inspection, and maintenance costs. Compact. Simple. Dependable. Its horizontal design positively separates your product from the crankcase . . . and makes every part easy to get at.

Just lift two plates and a Gaulin drive and plunger assembly is convenient for inspection or repair.

A Gaulin Cylinder may be disassembled in a matter of minutes.

Vibrationless. A Gaulin is practically free of vibration.

Corrosion-proof. All product contacting parts are stainless steel. Ceramic plungers or other materials are available for special applications.

Rugged Dependability. Thousands of installations with well-known companies prove a Gaulin provides unusually long service at minimum cost.

Write for Bulletin

Name Your Capacity

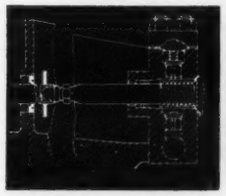
There's a Gaulin to handle your capacity from 50 GPH up to 5000 GPH.

Name Your Pressure

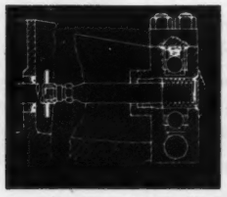
Gaulins are designed for 3 basic pressure ranges — up to 3000, 5000 and 8000 psi.

Name Your Product

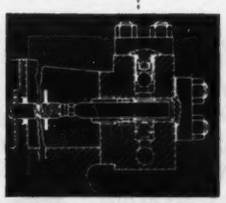
Only Gaulin designs a specific cylinder to handle every product efficiently, economically. Note some of our designs below.



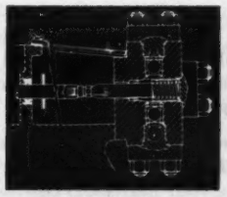
For Fluid, non-abrasive products the Gaulin Spring-Loaded Poppet Valve provides low initial cost and low maintenance.



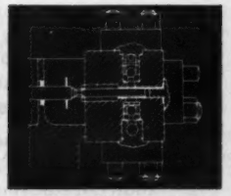
For Viscous, heavy-bodied products, the Gaulin Ball Valve (spring-loaded packing, inserted seats) provides excellent pumping efficiency and minimum maintenance.



For Slightly Abrasive, viscous products, the Gaulin Ball Valve (adjusting screw packing, inserted seats) keeps maintenance costs down.



For Slightly Abrasive, viscous products, where maintenance must be accomplished in minutes, the Gaulin Ball Valve with removable seats (spring-loaded packing) cuts maintenance time to the bone.



For Very Abrasive products, the Gaulin Ball Valve (with adjusting screw packing, removable seats) provides the ultimate in low cost maintenance.

Gaulin

Manton-Gaulin

Manufacturing Company, Inc., 55 Garden St., Everett 49, Mass.

WORLD'S OLDEST AND LARGEST MANUFACTURER OF HOMOGENIZERS, COLLOID MILLS, TRIPLEX STAINLESS-STEEL HIGH PRESSURE PUMPS

When inquiring check CP 8029 opposite last page



Owner: Bridgeport Brass Company

Engineers and Principal Builders: The H. K. Ferguson Company

Type of Installation: Acid-Proof Membrane and Brick Foundation for Copper Pickling Tanks.

SPECIFICATIONS

1. Inspect concrete surfaces for honeycomb. Make necessary repairs, prime required area with one coat Ceilcote Primecote No. 83P.

2. Apply ¼" Ceilcote Hot Mastic bituminous base acid-proof membrane in two coats to the specified areas.

Acid-Proof Brick — First quality acid-proof shale, 8" x 3¾" x 2¼" laid on floors and walls.

Acid-Proof Cement — Corobond furfuryl alcohol resin base with carbonaceous filler. Brick set in ⅛" bed Corobond.

On this installation, Ceilcote services consisted of materials, supervision, labor and equipment . . . on a guaranteed basis. The working properties of Ceilcote Corobond plus experienced brick masons made the neat appearance in all joints, both on the floors and piers, possible. Joints are filled and bricks remain in place even on sloping floors . . . allowing accuracy to ⅛" tolerance on the height of piers.

The Ceilcote Company is equipped to contract for an entire installation or for labor or materials only. We welcome the opportunity of studying your individual coating needs so that the best material for the job may be recommended.

3022-CC

Write today for new 4-page Catalog giving complete information on corrosion-proof services and products of the Ceilcote Co.



THE CEILCOTE COMPANY
CORROSION-PROOF MATERIAL AND CONSTRUCTION
4834 RIDGE ROAD • CLEVELAND 9, OHIO

When inquiring check CP 8030 opposite last page

Chemical drain pipe covered in circular

Vitrified clay pipe for handling and disposal of highly-corrosive industrial wastes is described in four-page circular. Installation features and specifications are given.

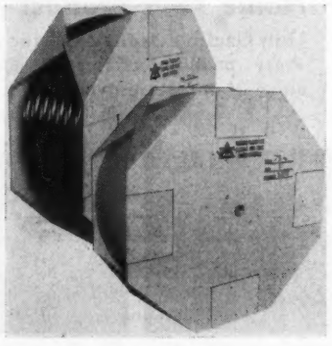
Bul on ChemiDrain is available from Logan Clay Products Co., Dept. CP, Box 698A, Logan, Ohio. When inquiring specify CP 8031 on handy Reader Service slip which is located opposite last page.

Flexible plastic pipe is conveniently packaged . . .

disposable cardboard reel aids in storing, dispensing

Uses: Pipe may be utilized to carry water, oil, gas, brine, and many chemicals.

Features: Flexible plastic pipe is packaged on a disposable cardboard reel. Pipe can be pulled off reel easily and quickly. Longer lengths can be used, eliminating "tag ends."



Reels are designed to stack compactly, saving storage space and protecting pipe from dirt, sunlight and mechanical damage.

Description: In flexible, pressure pipe, company offers two types: 75-lb, in ½ to 4"; and 100-lb, in ½ to 2". Also available is Schedule 40 rigid, high-impact pipe, ½ to 4", for pressures to



A two-position, 4-way valve for air or hydraulic fluids at pressures to 100 psi and vacuum to 25".

FEATURES:

Leak free operation. Low cost. Low handle torque. Low pressure drop. Easy panel mounting. Corrosion-resistant materials—bronze, aluminum. Simple maintenance—disassembly without disconnecting lines.

SPECIFICATIONS:

1. Fittings—Model S-576 for ¼" tubing port connections per AND10056. Model S-576-1 for ⅛" female pipe thread port connections.
2. Weight 6 ounces.
3. Seals—standard commercial "O" rings.
4. Finish—black anodized.
5. Size: 3¾" wide by 2⅝" deep, including handle.

For complete information, send for Bulletin 3000.

SPRAGUE *Engineering Corporation*
1144 WEST 135TH STREET, GARDENA, CALIFORNIA

When inquiring check CP 8032 opposite last page

New Line of STAINLESS STEEL PAILS at Big Savings!



New Welded Construction Equals Seamless or Spun

Entirely stainless (no solder) — smooth surfaces — sturdy 24 gauge type 304 analysis stainless — improved shape for easier carrying, better balance — handles, ears, chimes of heavy-duty stainless. Outstanding quality at lowest cost. Backed by Metalsmiths' 30 years' serving process industries.

SEND YOUR ORDER TODAY
PROMPT SHIPMENT

LOWEST PRICES — BIGGEST SELECTION ON THE MARKET	
10 qt. -	$ 9.25 ea.
12 qt. -	10.25 ea.
14 qt. -	11.25 ea.
16 qt. -	12.25 ea.
20 qt. -	13.50 ea.
24 qt. -	17.50 ea.

Discounts in quantity

METALSMITHS
Division of Orange Roller Bearing Co., Inc.
556 White Street Orange, N. J.

When inquiring check CP 8033 opposite last page

TYGON GASKETS *Resist* CHEMICAL ATTACK



Tygon plastic is tops for gasketing in acid handling service. Tough, flexible, highly resistant to acids and alkalies. Available in sheets, tubes or solid cord from which you can cut your own gaskets quickly and inexpensively. 65E

Plastics and Synthetics Division

U. S. STONEWARE

Akron 9, Ohio

WRITE *for* BULLETIN G-520

When inquiring check CP 8034 opposite last page

PACKAGED HEAT FOR FORCED AIR INSTALLATIONS

...TRENT "FOLDED-and-FORMED" HEATING UNIT PLUG



Here, in one compact "package" is a complete unit for efficient, high temperature controlled heating of forced air recirculating systems in annealing and tempering furnaces, heating ducts, baking and drying ovens. Multiple banks of Trent 'Folded-and-Formed" heating element racks are assembled, wired and mounted in a self contained insulated plug, complete with terminal control box. The unique construction of Trent "Folded-and-Formed" exposed ribbon type resistor elements assures maximum high temperature heat transfer... greater radiating surface per square inch of element cross section than any other type of electrical heating element.

TRENT "FOLDED-and-FORMED" HEATING UNIT PLUGS ARE GUARANTEED FOR FIVE YEARS!



TRENT FFP TYPE HEATING UNIT PLUG GIVES YOU

- Maximum Frame Temperatures to 1500°F.
- Velocities up to 2000 Ft./Min.
- More Wattage per Cubic Foot
- Watt Densities from 10 to 30 Watts per Sq. Inch
- Higher Temperature Operation
- 120, 240, 480 or 600V—3 Phase or Single Phase

These features add up to quicker heating and faster cooling, longer element and unit life . . . better controlled heat at lower cost.

Let our experienced Trent Heating Engineers analyze your requirements and recommend the best installation for your operations . . . or ask to see the new Trent "Folded-and-Formed" Heating Element booklet.

TREN INC.

Electrically Heated Industrial Equipment

247 LEVERINGTON AVE., PHILA. 27, PA.

When inquiring check CP 8035 opposite last page

150 psi; and Schedule 80 rigid pipe, ½ to 4", for pressures to 300 psi.

(Plastic pipe packaged in cardboard reels is a product of Triangle Conduit and Cable Co., Inc., Dept. CP, 6900 Jersey Ave., New Brunswick, N.J. . . . or for more information check CP 8036 opposite last page.)

Higher speeds handled by packing made of Teflon yarn

Uses: Recommended for rugged and corrosive service on pump shafts and valve stems.

Features: Teflon yarn packing is designed to function at higher peripheral speeds. Braided construction also enables it to run cooler.

Description: Packing affords all the anti-corrosive, thermal, mechanical, and other advantages of Teflon. Where lubrication is required, packing can be impregnated with fluorolube or other suitable lubricants. It is available in sizes ⅛ through ⅝"", 1/16" graduations.

(Teflon yarn packing is produced by Crane Packing Co., Dept. CPC, 1800 Cuyler Ave., Chicago 13, Ill. . . . or for more information check CP 8037 on handy form opposite last page.)

How to stop rust in industry

Treatise on rust prevention, included in 24-page catalog, is dedicated to showing industry how to stop rust. Included are complete instructions for surface preparation and application of company's rust-preventing products.

Form No. 254 is available from Rust-Oleum Corp., Dept. CP, 2799 Oakton St., Evanston, Illinois. When inquiring specify CP 8038 on handy form opposite last page.

For good chemical resistance—



Use NFM NYLON Filter Cloth

NFM Nylon Filter Cloth is not affected by

Most common alkalies	Alcohols
Most organic acids	Carbon Bisulphide
Halogenated hydrocarbons	Carbon Tetrachloride
Aldehydes	Trichloroethylene
Ketones	Benzene

In addition, the fiber strength of Nylon ranks first among all others, whether natural or synthetic. It has excellent heat resistance. It is unaffected by mold, fungi and bacteria growths. The extremely smooth surface of Nylon makes for easy cake discharge—even extremely sticky and tenacious cakes separate freely and cleanly from the face of the cloth. This is important since it reduces blinding and increases flow rates and filter capacity.

We also weave filter cloth of VINCEL†, SARAN, DYNEL, VINYON N, GLASS, DACRON††, TEFLON***, POLYETHYLENE, ORLON*.**

...for your Filter Paper requirements try NETONE Filter Paper. High tensile strength, chemical resistant ,high burst factor, abrasion resistant and crease resistant. Send for a test sample.

Write us for test samples—when you do, tell us about your filter problems.

*TM for duPont Acrylic Fiber
**TM UC&C Co.
***TM for duPont Tetrafluorethylene Fiber
†TM—NFM Reg. U. S. Pat. Off.
††TM for duPont Polyester Fiber

Weavers of Industrial Filter Media for over Forty Years

NFM **The National Filter Media Corp.**

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Los Angeles, Calif. 811 West 7th Street

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Cincinnati, Ohio Roselawn Center Bldg.
Houston, Texas 1503 Hadley St.
Oslo, Norway Nicolai Friis
Johannesburg, South Africa Edward L. Bateman

When inquiring check CP 8039 opposite last page



Illustrated is the stuffing box assembly of the Olivite Acid Handling Pump.

Maximum protection against corrosion and leakage are the prime requisites for a good acid-handling pump . . . and with OLIVITE you get both.

FOR CORROSION RESISTANCE . . . the cast-iron casing, cover and impeller are protected by a heavy covering of *Olivite* . . . a special rubber base plastic impervious to most chemicals, hot or cold, strong or weak.

FOR LEAKAGE PROTECTION . . . a floating stuffing box which constantly adjusts itself to the shaft . . . minimizes possibility of crushed packing or scoring of shaft sleeve. The resilient packing is of acid resisting material. Spring loaded wing nut adjustment enables operator to keep packing under proper pressure.

Thousands of Olivite Acid-Resisting pumps have been supplied to the Process industries during the past 30 odd years. The values of these years of design, manufacturing and operating experience are embodied in every 1¼", 2" or 4" Olivite Pump you purchase. Bulletin 308-R provides full details. When writing us please outline your pumping problems.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

When inquiring check CP 8040 opposite last page

For standard pressures where corrosion is a factor . . .

150-lb stainless pipe fittings have screw or welding ends

Uses: For standard pressure services where corrosion is a factor.

Features: 150-lb stainless fittings are manufactured in screw-end and socket-welding types in 304 and 316 steel.



Description: Fittings are available in sizes ⅛ to 2". Smaller sizes are machined from solid forgings. Larger sizes are made from stainless castings.

(150-lb stainless fittings are products of Watson-Stillman Fittings Div., H.K. Porter Co., Inc., Dept. CP, Roselle, N. J. . . . or for more information check CP 8041 on handy form opposite last page.)

Produce shear bolts of titanium . . .

research holds hope for wider use of metal

That a further taming of titanium has been accomplished is evidenced by the development of titanium shear bolts, which are reported to be equal to or better than comparable steel bolts. This shear bolt is the second of a series of fabricated titanium parts developed in a $500,000 titanium research program. First product of the research inquiry was a tension bolt announced earlier this year.

Successful fabrication of titanium, a previously perverse metal, leads

New ZINCOATER HOLDS PAINT BETTER ON GALVANIZING

Because zinc sticks to zinc, Tropical Zincoater (made with zinc dust) on galvanized iron provides a better, moisture-resistant base for finish paint. Paint jobs hold better, last longer, regardless of weather when Zincoater is applied on galvanized buildings, signs, truck bodies, water tanks, ducts, dams.

FREE! **Literature sent on your business letterhead request.** ***Write today!***

Heavy-duty Paints since 1883

TROPICAL PAINT COMPANY
1128-1232 West 70th St., Cleveland 2, Ohio
Subsidiary Parker Rust Proof Co.

When inquiring check CP 8042 opposite last page

You gotta be first . . .

to be best!*



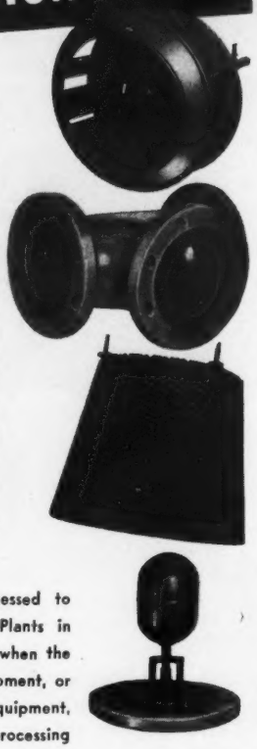
*25 years ago, Alloy Fabricators started to build Stainless Steel, Monel, Inconel, Nickel and Aluminum Process Equipment. With this experience, naturally, they're your *best bet today!*

It's Still Our Only Business — And We Mind It Well!

ALLOY FABRICATORS
DIVISION OF CONTINENTAL COPPER AND STEEL INDUSTRIES, INC.
PERTH AMBOY, NEW JERSEY

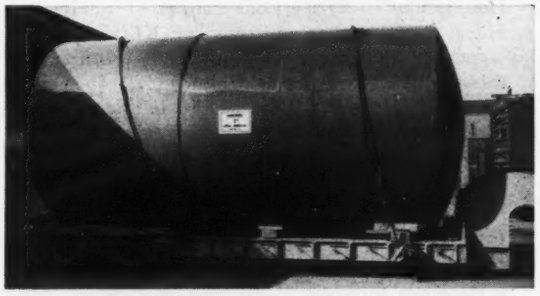
When inquiring check CP 8043 opposite last page

Keep Your Equipment Safe from CORROSION AND ABRASION . . .



Corrosion or abrasion can't get a foothold after "RUBBERHIDE" Linings have been processed to the exterior or interior surfaces of metal objects, regardless of their size, shape or service requirements . . . from thumb screws to 20,000 gallon tanks. Compounded from rubber or neoprene to provide proper resistance to the specific corrosive agents involved, or to combat abrasive wear, these modern Linings invariably repay many times their cost through extended life of the products, parts or equipment to which they have been applied.

"RUBBERHIDE" Linings are processed to objects shipped to our Linings Plants in Trenton, Chicago or Houston; or, when the objects are too large for such shipment, or the work involves fixed plant equipment, experienced field crews do the processing "on location". Whether factory or field processed, you can rely on "RUBBERHIDE" Linings for effective, longlasting protection.



Contact Our Nearest Branch for Details

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Detroit • St. Paul Los Angeles • San Francisco • Seattle • Spokane • Portland • Salt Lake City • Denver Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

Est. 1870

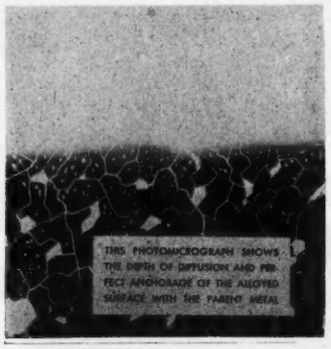
When inquiring check CP 8044 opposite last page

to hope for its wider application, most certainly in the chemical industry where its corrosion-resistant properties could be put to excellent use.

(Titanium shear bolts are products of Standard Pressed Steel Co., Dept. CP, Jenkintown 44, Pa. . . . or for more information check CP 8045 on the convenient Reader Service slip which is located opposite last page.)

Permits ferrous metals to resist severest corrosive service

Process that diffuses chromium into ferrous metals and forms a stainless surface alloy to depths from 0.001 to 0.008" and more, without causing dimensional changes, has been developed.



It permits ferrous metals to resist corrosion even under most severe atmospheric, water, and chemical conditions. Surface resists wear and abrasion and thermal oxidation even at temperatures to 1700°F.

Products can be welded before or after processing, mild steel procedures being used before processing and stainless steel procedures after processing.

(Chromium diffusion process is a development of Alloy Surfaces Company, Dept. CP, 1115 N. Thirty-Eighth Street, Philadelphia 4, Pa. . . . or for more information check CP 8046 on the convenient Reader Service slip which is located opposite last page.)



An order for 48 ODS Pumps being readied for shipment to a leading chemical plant.

The exclusive combination of "no mechanical link to the diaphragm" . . . "no slots or holes in the diaphragm" make the ODS the simplest, maintenance-free slurry pump that you can buy or use where operations call for a diaphragm-operated pump.

A timed impulse pneumatically (not mechanically) transmits power uniformly through the diaphragm to the slurry or solution being handled.

The ODS Pump has a variable volume . . . controlled by an electric timer which may be located at a point convenient to the operator any distance from the pump.

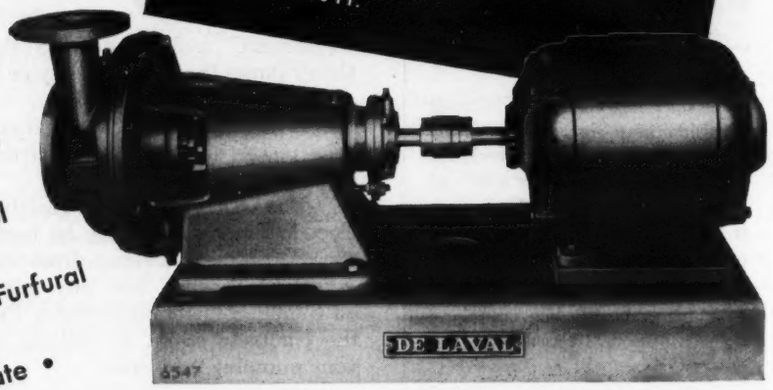
Why not find out why numerous companies standardize on the ODS Diaphragm Slurry Pump? Bulletin No. 309R gives the complete story. In writing for your copy, please tell us your pumping problems.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

When inquiring check CP 8047 opposite last page

• Calcium chloride brine • Flushing liquor
Sodium sulphate • Asbestos fiber & cement mix • Green liquor •
Soap solution • Grinder coolant • Carbon slurry • Cane wash • Salt brine • Sea water •
• Caustic solution • Bleach liquor • Grape juice concentrate • Tomato juice concentrate •
Tomato puree • Propanol • Soap liquor • Cane juice • Aqueous lime • Coke oven oil •
• Paper stock • Waste sulphite liquor • Alkylaryl sulfonate • Sugar liquor • Vinyl pyridine
• Saturated brine • Grape juice • Tomato juice • Press liquor • Calcium bisulphite • Melt
Phenolized ammonia • Ammonia liquor • Sulphuric acid • Paraffine oil and water • Sludge
• Milk waste • Gritty water • Cane syrup • Lime & soda solution • Cachaza • Clear juice
White water • Mineral oil • Chromic acid Cement • Gasoline • Depanol
Brine • Vegetable oil • Licorice liquor • Flume water •
• River water • Benzine thinner • Mash
Methylene chloride • Sodium hydroxide
Sizing solution • Alcohol •
• Steep soda • Caustic soda
Black liquor • Ethylene glycol
• Fuel oil • Furfural
• Condensate •

One pump handles all these liquids...
DE LAVAL CPO PROCESS PUMP
CAPACITIES TO 2,000 GPM
HEADS TO 200 FT.



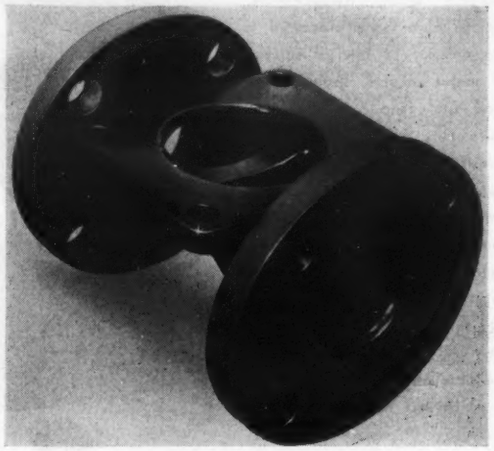


DE LAVAL Centrifugal Pumps
DE LAVAL STEAM TURBINE COMPANY
889 Nottingham Way, Trenton 2, New Jersey
DL 281
WRITE FOR BULLETIN 1125-B

Fluorocarbon polymer dispersions protect equipment under severe corrosive conditions

Uses: On equipment operating under extremely high temperature and corrosive service conditions.

Features: Brush, spray, or dip application of dispersions results in a tough, continuous coating with all important properties of original plastic: high resistance to temperature approaching 400°F and low-temp flex; excellent resistance to chemi-



Five coats of KEL-F dispersion were applied to this valve prior to baking—note gloss

cals, including alkalis, mineral acids, strong oxidizing acids, solvents; low permeability to moisture, organic and inorganic liquids and vapors; high abrasion resistance and tensile strength; low cold flow and high impact resistance; high dielectric strength and electrical resistivity; and non-toxic and non-sticking characteristics.

Description: Dispersions consist of finely divided particles, 1-20 microns, of KEL-F plastic suspended in volatile organic liquids, similar to those employed in normal paint and lacquer systems. Organic media have been carefully selected for proper viscosity and volatility characteristics to permit rapid spray application of non-sagging, non-running, smooth, wet films which fuse to a film thickness of approximately 2-2.5 mils.

Coating thickness is dependent on application. For corrosion control, usual practice recommends a minimum thickness of 10 mils built up in four or five successive coats. For extremely severe corrosion problems, however, coatings are occasionally built-up in thicknesses of 15-20 mils. For release or anti-sticking applications, a 4-6 mil film is used.

(KEL-F plastic dispersions are products of the M.W. Kellogg Company, a subsidiary of Pullman Inc., Dept. CP, 225 Broadway, New York 7, N.Y. Check CP 8048 opposite last page.)



STAINLESS STEEL

...fights corrosion...solves many piping problems

● Stainless steel piping, using TUBE-TURN* Stainless Steel Welding Fittings, can provide long, safe service where corrosive gases or fluids are handled. Likewise, stainless steel systems are superior where temperature extremes are encountered, for handling dangerous materials safely, for preventing contamination.

Tube Turns offers a *complete line* of Stainless Steel Welding Fittings in three analyses: AISI Type 304, Type 347, and Type 316; and in four schedules: 5S and 10S (thin wall), and 40S and 80S (heavy wall). For the *right* stainless steel welding fittings, and for help in proper application, get in touch with your Tube Turns' Distributor. You'll find one in every principal city.

TUBE-TURN Welding Fittings and Flanges are made in U.S.A.
They meet all U.S. piping code specifications

TUBE TURNS LOUISVILLE 1, KENTUCKY

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Chicago • Denver • Los Angeles
San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas

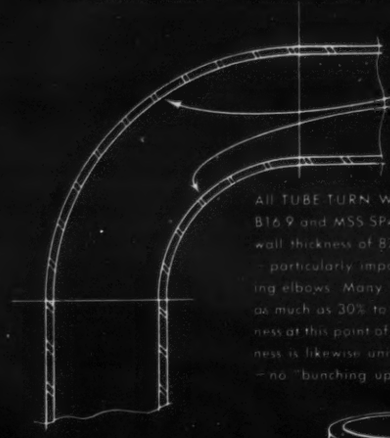


*"tt" and "TUBE-TURN" Reg. U.S. Pat. Off.

STAINLESS DATA

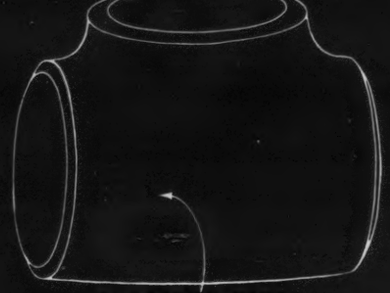
How you get *extra service* from TUBE-TURN* Stainless Steel Welding Fittings

EXTRA-VALUE FEATURES AT NO EXTRA COST



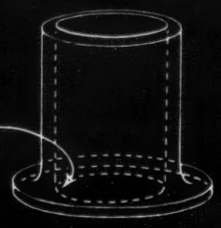
UNIFORM WALL ASSURES UNIFORM STRENGTH

All TUBE-TURN Welding Elbows meet ASA B16.9 and MSS SP43 Standards on minimum wall thickness of 87½% of nominal thickness — particularly important on thin wall welding elbows. Many elbows on the market are as much as 30% to 40% below nominal thickness at this point of greatest wear. Wall thickness is likewise uniform on the inside radius — no "bunching up" of metal.



MATCHES PIPE BURSTING STRENGTH

Welding Tees are adequately reinforced. Along with other TUBE-TURN Welding Fittings their strength matches the calculated bursting strength of the pipe.



NO CORROSION POCKETS

TUBE-TURN Lap Joint Stub Ends have a square inside corner which eliminates a "corrosion pocket" and a proper fillet radius which assures strength under flexing and vibration.

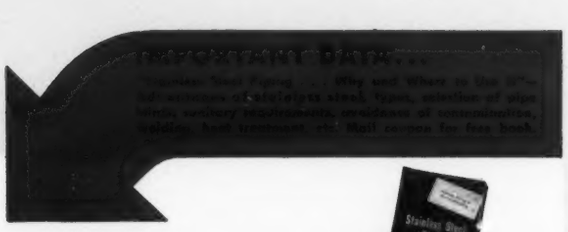
CHECK THESE FEATURES
Only TUBE TURNS offers them all

- **Fittings meet standard chemistry specifications**
- **Minimum wall thickness of elbows 87½% of nominal**
- **Fittings meet minimum calculated bursting pressure of matching pipe**
- **Qualified welders and procedures used where welding is required**
- **Each fitting properly solution heat treated**
- **Each fitting passivated**
- **Other special grades of stainless steel, and all other alloys available**

All these extra value features available to you at no extra cost.

MEET *ALL* CODES

TUBE-TURN Stainless Steel Welding Fittings meet all specifications: ASTM A312 (for material); MSS SP43 and ASA B16.9 (for dimensions); and MSS SP25 (marking procedure).



TUBE TURNS, Dept. KK-2A
224 East Broadway, Louisville 1, Kentucky
Please send STAINLESS STEEL "WHY AND WHERE" book.

Company Name _____

Company Address _____

City _____ *Zone* _____ *State* _____

Your Name _____

Position _____



DISTRICT OFFICES

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Philadelphia	San Francisco
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Cleveland	Atlanta
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Detroit	Houston
Denver	Dallas

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* "tt" and "TUBE-TURN" Reg. U.S. Pat. Off.

TUBE TURNS

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
LOUISVILLE 1, KENTUCKY

Resists acetic acid attack even when liquid temps are 150°F

Extreme resistance to vinegar and acetic acid corrosion, both internal and external even when liquid is heated to 150°F . . . one reason why vinegar and sugar-water carrying lines made from high impact vinyl plastic are now being used by The H. W. Madison Company, Medina, Ohio. Plastic, replacing more expensive metal piping, carries these materials for use in canning and processing Dolly Madison pickles and mayonnaise.



A section of The H. W. Madison Company's vinegar plant where rigid vinyl pipe is used extensively

In the vinegar manufacturing plant, the vinyl pipe and fittings run from top of huge tank holding vinegar down through a filter on the floor and back up into another vat. Here the vinegar is mixed with alcohol, bacteria food, and water, and then pumped into generators where mixture filters down through beechwood shavings containing bacteria which transform this mixture into 100-grain vinegar.

Other advantages being realized by Madison, with use of vinyl plastic pipe in this service, are: 1) no scaling inside pipe to contaminate food or block valves, slowing down liquid flow; 2) lower cost in initial expenditure for material; and 3) easier and less costly installation and maintenance.

(Geon resin, from which vinyl plastic pipe is fabricated, is a product of B. F. Goodrich Chemical Co., a division of The B. F. Goodrich Co., Dept. CP, 2060 E. Ninth St., Cleveland 15, Ohio . . . or for more information check CP 8049 opposite last page.)

(Van-Cor rigid vinyl pipe and fittings are fabricated by The Colonial Plastics Mfg. Co., Dept. CP, 8007 Grand Ave., Cleveland 4, Ohio . . . or for more information check CP 8049A opposite last page.)

For more information on product at left, specify CP 8050 . . . see information request blank opposite last page.

Now . . . your own painter can "COLD-GALVANIZE" any steel surface with

DIMETCOTE

* the 100% inorganic zinc coating

any PLACE

any TIME

any WHERE

SPRAY or BRUSH

Dimetcote is absolutely unique. It is not a paint, it contains no oils, resins or any other organic materials, yet it can be applied by spray or brush. When Dimetcote is applied to steel, a reaction takes place at the surface which produces chemical bonding as well as physical adhesion. It is almost impossible to find the interface between Dimetcote and the steel.

Dimetcote has many unusual characteristics. It shows no visible change after more than ten years exposure to the most severe weather conditions – sun, heat, fresh and salt water. It is insoluble in all solvents and petroleum products. It is highly abrasion resistant, but if abraded through to bare steel, the coating will cathodically inhibit corrosion.

Now tanks and structures can be given the same protection that galvanizing affords, *plus salt water resistance.* Existing structures need not be dismantled and new structures can be coated either before or after erection. *Only one coat* of Dimetcote over a sandblasted surface is required to protect such structures as:

Tank Exteriors • Cargo Tanks in Tankers • Dam Gates • Structural Steel • Christmas Trees • Buoys • Floating Roof Tanks • Offshore Rigs • Water Tanks • Barges • Ship Decks • Stacks

Write for the Dimetcote Technical Bulletin today.

Follow the line of MOST resistance: Amercoat® CORPORATION

Dept. EG,
4809 Firestone Blvd.,
South Gate, California

Evanston, Ill. • Kenilworth, N. J. • Jacksonville, Fla. • Houston, Tex.

When inquiring check CP 8051 opposite last page



Their problem? . . .

CORROSION

of industrial equipment, materials

Their location? . . . anywhere in the nation . . .

their dependable, economical answer . . .

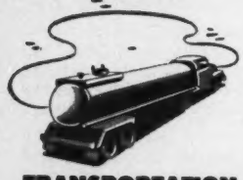
ARco RUBBER PROTECTIVE LININGS and COATINGS



PROCESSING



STORAGE



TRANSPORTATION



● Whenever there's the slightest evidence of corrosion, there's the beginning of future losses . . . down-time, equipment and *customers.*

Even before this menace appears, ARco Engineers and ARco Anti-Corrosion Rubber Protective Coatings should be considered . . . for the long term savings they will deliver for a reasonable initial cost.

Regardless of your location . . . ARco Engineers will design, fabricate, insulate, and erect complete ventilation, storage, and processing installations . . . or, work with your equipment supplier in corrosion-proofing your systems.

Yes, due consideration to the problem of corrosion will produce the only logical answer . . . ARco engineering know-how and ARco Protective Coatings!

ARco FIELD SERVICE UNITS

ARco Field Service Engineers bring complete technical know-how and facilities right into your plant. Permanent installations or equipment too large to move can be fabricated and covered right on the job by our Field Service Units.

ARco

Write for complete information today!

MANUFACTURERS • DESIGNERS • ENGINEERS

Automotive Rubber Company, Inc.

12568 BEECH ROAD • DETROIT 39, MICHIGAN

●

ARco Rubber Processors

4033 HOMESTEAD ROAD • HOUSTON, TEXAS

When inquiring check CP 8052 opposite last page

For emergency uses — shredded Teflon packing

Uses: As a stock item for emergency use or as a regular packing for centrifugal applications.

Features: Qualities of pure Teflon are incorporated in packing. It is chemically inert and will not be attacked by any organic or inorganic acids, alkalis, or solvents.

Packing is serviceable from −150° to 550°F.



Description: Teflon packing is composed of shredded Teflon combined with suitable binders and lubricants extruded into an open, cotton yarn jacket impregnated with graphite. It is easily installed by simply cutting packing in necessary lengths, coiling around shaft, and placing it into stuffing box by any suitable means. Cotton jacket makes possible this easy installation.

Packing is available in sizes ¼ to ¾" in increments of 1/16".

(Flexrock 403 Teflon packing is a product of Packing Division, Flexrock Company, Dept. CP, 3611 Filbert St., Philadelphia 1, Pa. Check CP 8053 opp. last page.)

Titanium, alloys

Forty-two technical reports on titanium and its alloys are offered as a package, selling for $40, by Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.

NOW! *Iolyte* LAMINATED FIBERGLAS* CROCKS



- PRACTICALLY UNBREAKABLE
- CHEMICALLY RESISTANT
- LIGHTWEIGHT
- INEXPENSIVE
- NOT TAPERED

*Trade mark of Owens-Corning Fiberglas Corp., Toledo, O.

Available from Stock — PRICE LIST

GAL. CAP.	OUTS. DIAM.	OUTS. HGHT.	LIST COST	GAL. CAP.	OUTS. DIAM.	OUTS. HGHT.	LIST COST
5	9"	18"	18.00	14	18"	12"	35.00
5	10"	15"	18.00	20	18"	18"	40.00
8	12"	16"	22.00	26	18"	24"	45.00
10	12"	20"	24.00	30	18"	28"	49.00
12	12"	24"	26.00	40	18"	36"	59.00
9	10"	24"	23.00	50	18"	48"	69.00
7	9"	24"	21.00	27	22"	18"	49.00
10	16"	12"	26.00	30	22"	20"	53.00
12	16"	14"	28.00	55	22"	36"	70.00
15	16"	18"	33.00	73	22"	48"	83.00
20	16"	24"	40.00	55	28"	22"	76.00
30	16"	36"	49.00	95	28"	36"	98.00
40	16"	48"	59.00	125	28"	48"	125.00

Distributor Territories Open

Order from us or from your distributor. Unless rated firm, payment with order. No C.O.D.'s. All prices FOB, Factory.

SCHORI PROCESS DIVISION

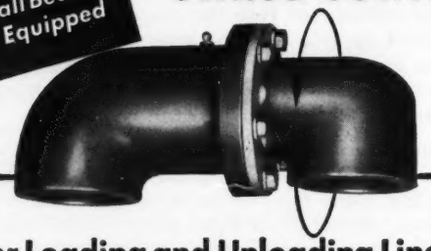
FERRO CO CORPORATION

8-10 43RD ROAD, LONG ISLAND CITY 1, N. Y.
FACTORY: 59-31 54TH STREET, MASPETH, L. I.

When inquiring check CP 8054 opposite last page

NEW! Ball Bearing Equipped

BARCO SWING JOINTS



for Loading and Unloading Lines

BARCO'S new, attractively priced, all-steel ball bearing *Swing Joints* are specifically designed to provide for movement and flexibility in metal pipe loading and unloading lines handling gasoline, oil, alcohol, chemicals, and other fluids.

11 DIFFERENT STYLES—Barco offers single swing, double swing, and counterbalance styles to meet every need. Sizes 1", 1½", 2", 2½", 3", 4".

SUPERIOR DESIGN — The ball bearings will not fall out when joints are taken apart. Long bearing provides adequate pipe support. Special O-ring seal insures leakproof service over wide temperature range, −40°F to +225°F.

INFORMATION—Send for latest Catalog No. 400 and engineering information. BARCO MANUFACTURING CO., 537H Hough St., Barrington, Illinois.
A Chicago Suburb

When inquiring check CP 8055 opposite last page

Prevents acid from shorting out underground electrical lines

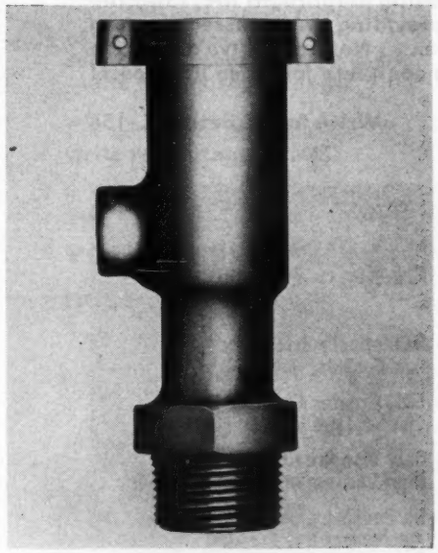
Problem: In the ethyl chloride production area of the National Petro-Chemical plant at Tuscola, Ill., spilled acids and acid vapors were eating away insulation of underground electrical lines and shorting them. This meant finding the shorts, digging them up, or replacing the line.

Solution: Electrical lines were given a coal tar coating. This was supplied in the form of a tar-saturated, close-woven fabric which comes in rolls. Tape is resistant to moisture, acids, alkalis, soil stress, chemical fumes, etc.

It is applied by spiral or "cigarette" wrapping with use of a torch to bleed the coating for a bond to the pipe. Rolls are supplied in 2", 3", 4", 6" and 18" widths in rolls about 50' long.

Results: In service over a year, the tape has completely eliminated shorting.

(Tapecoat is a product of The Tapecoat Co., Dept. CP, 1523 Lyons St., Evanston, Ill. . . . or for more information check CP 8056 opposite last page.)



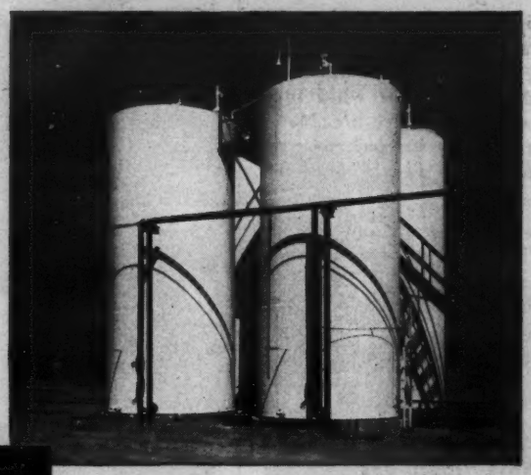
Polyethylene drum faucet is designed to fit all ¾" standard drum openings. Priced lower than metal faucets, it is said to be more durable and lighter in weight. Plastic material will not react with strong acids, alkalis, oils. Faucet operates without leaking, regardless of temperature. Unit is available in a bronze color — or in special colors on request.

(Plastic drum faucet is a product of Multi-Meter Corp., Dept. CP, Box 154, West Toledo Station, Toledo 12, Ohio. Check CP 8057 opposite last page.)

EPON RESIN does it!

New paint lasts years ...resists corrosive spillage at Diamond Alkali plant





HERE'S HOW...

PAINT LEADS a hard life at the Diamond Alkali Company agricultural chemicals plant in Houston, Texas . . . and no ordinary paint can survive there for long!

A few reasons for paint failure: Processing vessels and storage tanks are subjected to spillage of chlorinated hydrocarbons and benzene, and some also to heat. In parts of the plant, painted surfaces are exposed to the highly corrosive fumes of hydrogen chloride and sulfuric acid.

In their search to find a tougher, longer lasting paint, Diamond Alkali maintenance men tried coatings of many types, including heavy duty maintenance finishes. Some "washed off" immediately; some lasted 6 to 8 months. Finally, Epon resin coatings based on the XA-200 formulation were tried — and found outstandingly successful.

The Epon cold-cured paint, applied by spraying throughout the entire plant, has been in service for *more than two years with no failure.* Painting costs — for both material and labor—are a mere fraction of what they formerly were, reports Diamond Alkali.

Call on our sales offices for names of suppliers who sell Epon resin coatings for your needs. Write for the full Epon coatings story in the new brochure, *"Planning to Paint a Pyramid?"*

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Chemical Division, Shell Oil Company of Canada, Limited
Toronto • Montreal • Vancouver

When inquiring check CP 8058 opposite last page

Protects against chipping and corrosion . . .

rubbery texture gives long life to coating

Uses: Protection of old or new equipment and structures against splash, fumes or spillage of non-oxidizing inorganic acids, alkalis, inorganic salts, and most polar solvents.

Features: In addition to its corrosion-resistant properties, coating is also effective where chipping and abrasion make use of paints impractical.

Description: Self-curing coating, called Palladium liquid neoprene, has a rubbery texture and high thickness per coat which provides extended service life. Material is available in black or gray and may be applied by brush or spray.

(More information on coating may be obtained from Emjay Maintenance Engineers, Dept. CP, 327 Union Ave., Rutherford, N.J. . . . or check CP 8059 on handy form opposite last page.)

For those "touch-ups", fast-drying coating is aerosol-packed

Uses: As primer and finish for most metal painting including galvanized, aluminum, iron, or steel whether rusted or clean, damp or dry, painted or unpainted.

Features: Coating, available in standard containers, is also aerosol-packed, making it handy for touch-up jobs. It is resistant to most chemical fumes and spillage, gasoline, oils, fruit acids, caustics. It is particularly useful for penetrating and stopping irremovable rust.

Description: Metal coating dries in 10 to 15 min under normal conditions. It is resistant to heat up to 250°F and its chemical resistance is equal to that of most vinyls. Colors available are red, olive green, light gray, zinc

2 Stock Answers for T



Farris X-V Series

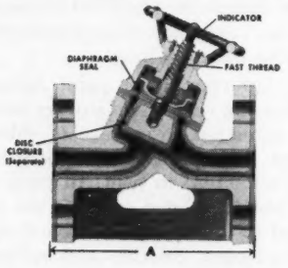
This versatile, dependable, economically-priced hand valve is equally at home in corrosion, abrasion, vacuum or general service—wherever positive action is needed. The X-V Series disc—for positive closure—and diaphragm—for positive sealing—work independently, with only the disc exposed to pressure in the closed position, substantially increasing diaphragm life, lowering torque and providing unsurpassed vacuum service . . . No other valve does such a complete job at so little cost!

Write for Bulletin FL-154



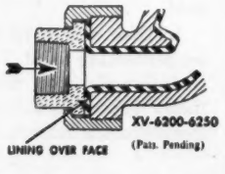
DISC for positive closure

DIAPHRAGM for positive sealing



NEW

Corrosion Resistant Union Ends

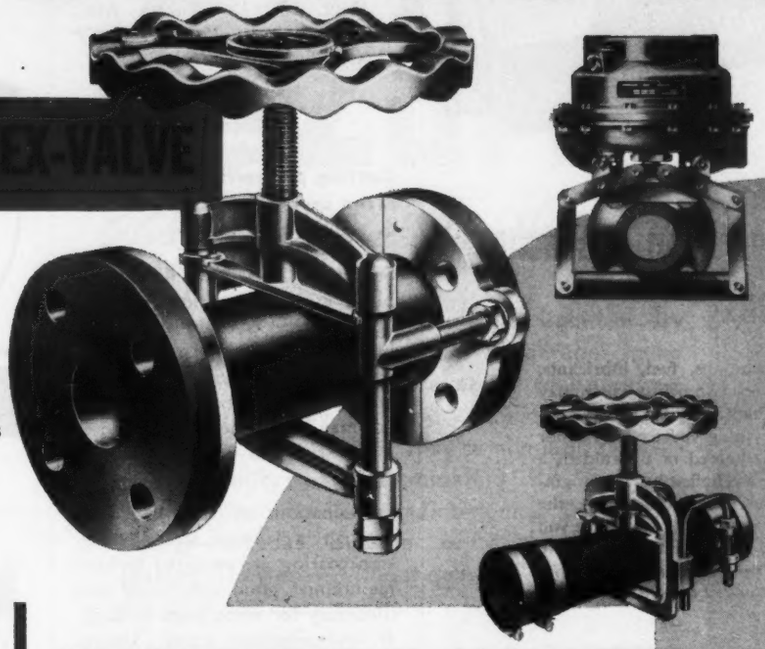


X-V Series Design Features

- Realistically-Priced for Low-Cost Service
- 50% Greater Capacity than Similar Type Valves
- Only Disc Area Exposed to High Vacuum in Closed Position
- No Packing Gland to Leak. Mechanism Not Exposed
- Low Hand-Wheel Torque... Easy to Operate
- Available in Lined or Unlined Models...With Corrosion Resistant Union Ends.

Tough Valve Problems

Farris Pinch-type FLEX-VALVE



No other valve controls the flow of hard-to-handle corrosive and abrasive materials with the efficiency and reliability of the Farris Pinch-Type FLEX-VALVE . . . because FLEX-VALVE cannot plug! This is the simplest valve made—only two components—employing the fundamental principle of pinching off the rugged, flexible valve body. Case histories show batteries of these valves in severe service for more than 20 years—and still going strong!

For complete information write for Catalog FL-382

YOUR MONEY BACK IF IT PLUGS!

Flex-Valve's Exclusive Advantages

- Will Outwear Any Metal Valve in Abrasive Service
- Full Pipe Capacity
- Maintenance Free
- Bubble Air-Tight
- Low Replacement Cost
- No Obstructions, Pockets or Internal Parts
- Available in Rubber, Neoprene, Butyl, Buna-N, Buna-S, Food Stock and Special Compounds.
- Air or Hand-operated Types

Farris

There is no compromise with experience!
There is only one FLEX-VALVE

FLEXIBLE VALVE CORPORATION
410 COMMERCIAL AVENUE, PALISADES PARK, NEW JERSEY

affiliates: FARRIS ENGINEERING CORP. • FARRIS STACON CORP.
FARRIS HYDROSEAL CORP. • FARRIS HYDROTORQUE CORP. • FARRIS PICKERING GOVERNOR CO.

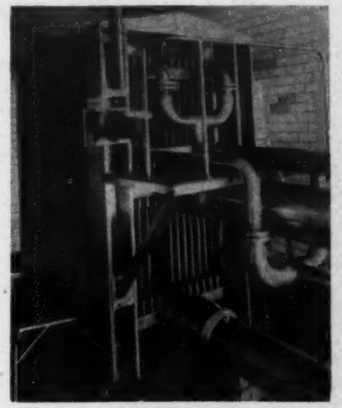
chromate, machine gray, and aluminum.

(Totrust instant-dry metal coat is a product of The Wilbur & Williams Co., Dept. CP, 130 Lincoln St., Boston 35, Mass. Check CP 8060 opposite last page.)

Stainless steel guards quality of beer

Stainless steel has been given an important part in the quality control program of Falstaff Brewing Corporation.

Shown here is a wort cooler in the company's modern plant in Omaha. The cooler's 3 and 4" piping of Type 347 stainless was

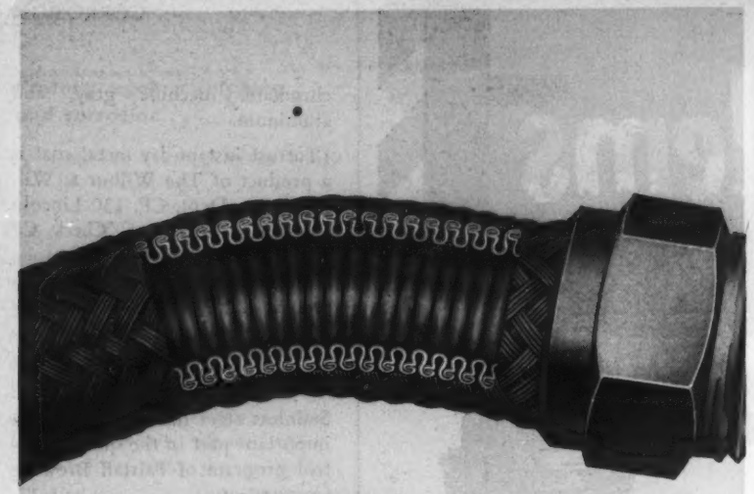


fabricated with stainless welding fittings and flanges. Piping conveys water to and from equipment during wort cooling period.

Originally, piping of other material had been recommended, but Falstaff's engineering staff decided to specify stainless to guard against corrosion and help insure quality control.

(Stainless steel welding fittings and flanges are products of Tube Turns, a division of National Cylinder Gas Co., Dept. CP, 224 E. Broadway, Louisville 1, Ky. Check CP 8061 opposite last page.)

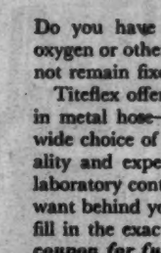
For more information on product at left, specify CP 8062 . . . see information request blank opposite last page.



...to handle vibration, temperature and corrosion headaches in conveying applications

Do you have to conduct water, solutions, fuel, lubricants, oxygen or other gases or liquids between two points which may not remain fixed? Your answer is Titeflex flexible metal hose.

Titeflex offers you just about everything you could wish for in metal hose—seamed or seamless, braided or unbraided, a wide choice of alloys and fittings. And Titeflex has the originality and experience to simplify your design difficulties—the laboratory control and development engineering assistance you want behind you. All you have to do is send your drawing; we fill in the exact hose type required. ***Telephone or mail in the coupon for full information about metal hose and its uses, catalog f200.***



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Your knowledge of metal hose applications may be helpful to us. Please send your complete catalog—without obligation.

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When inquiring check CP 8063 opposite last page

CORROSION

Condensate corrosion

How different plants solved condensate corrosion problems is outlined in folder. An evaluation of feedwater, makeup water, steam, and condensate cycle is discussed.

"Condensate Corrosion" is issued by Hall Laboratories, Inc., Dept. CP, 323 Fourth Ave., Pittsburgh 30, Pa. Specify CP 8064 opposite last page.

Coating properties good after seven years wear in industrial area

Serving to offset the dislike for black asphaltic coatings, regardless of their economy and durability, is an asphalt-base aluminum paint. Designed for compatibility with asphalt coatings, this product may be brushed or sprayed at a coverage of 250 to 300 sq ft/gal.

Combinations of the paint and company's clay-type asphalt emulsion coating are reported to have maintained good reflectivity and continuity for seven years in highly industrialized areas. Longer service is anticipated, but more experience is needed. (Caution: resin or varnish grade aluminum paint should not be used over an asphalt-base coating of any kind.)

(Asphalt-base aluminum paint and Type B(C-13-HPC) asphalt emulsion are products of The Flintkote Co., Inc., Dept. CP 30 Rockefeller Plaza, New York 20, N.Y. . . . or check CP 8065 opposite last page)

Titanium tubing, pipe

Two grades of titanium tubing and pipe are described in four-page catalog which also lists advantages and applications.

T.D. 115 is issued by Alloy Tube Div., The Carpenter Steel Co., Dept. CP, 110 Springfield Rd., Union, N.J. Specify CP 8066 opposite last page.

PUMP

Liquids • Gases • Slurries

WITHOUT CORROSION OR CONTAMINATION



Prices range from.....$55 to $500
depending on size of pump and accessory equipment required.

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FOR CONDITIONING AND CONTROL OF COMPRESSED AIR

Autopneumatic control assembly . . . or individual units

filters/lubricators/regulators/water trap

Reduces MAINTENANCE-REPAIR and DOWN TIME to a minimum on all AIR POWER TOOLS and APPLIANCES.

Pipe line sizes: ¼", ⅜", ½", ¾", 1" — and larger capacity

Write for twenty-page illustrated catalog and literature

arrow tools, incorporated
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When inquiring check CP 8068 opposite last page

Cooling tower wood can be protected

Four-page technical paper tells how chemical and bacteriological attack of wood cooling towers can be controlled by acid treatment and wood preservatives to kill fungi.

Technical paper 130 is issued by W. H. & L. D. Betz, Dept. CP, Gillingham & Worth Sts., Philadelphia 24, Pa. Check CP 8069 opposite last page.

More build per coat, lower cost are advantages offered by hot sprayed vinyl coating . . .

no thinners needed even though solids content is over 40 per cent

Field tests of a hot spray system for application of a recently developed vinyl coating have revealed many advantages of the coating. Even though the solids content of the vinyl coating is over 40%, it can be sprayed without thinning. This is because of the critical solvent balance maintained in the material. As result, 4 to 5 mil dry film thickness is obtained by one spray pass and there is no run or sag of coating on vertical surfaces.

Thus, time is saved because of fewer coats needed and faster application increases man-hour efficiency. More build per coat means lower total cost per square foot of surface. There is less waste through overspray giving better spraying conditions and more coverage per gallon. Final result is thicker, more corrosion-resistant coating on flat surfaces and heavier film build-up on hard-to-protect edges and projections.

Field tests of this hot spray vinyl coating system were conducted by Metal Cladding, Inc. of North Tonawanda, N.Y. using a heater of the circulating type made by Spee-Flo Corp., Houston, Texas.

(Hot Spray Vinyl coating is a development of Prufcoat Laboratories, Inc., Dept. CP, 50 E. 42nd St., New York 17, N.Y. Check CP 8070 opp. last page.)

Paper covers sandblasting from practical view

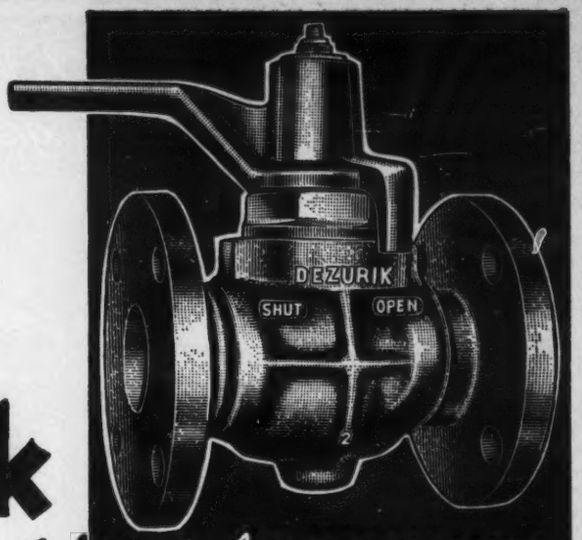
Nine-page report describes sandblasting from a practical standpoint. The 21 topics covered should be of considerable value to anyone engaged in surface preparation work. Information is presented in non-technical language.

Report on sandblasting may be obtained from Clementina Ltd., Dept. CP, 2277 Jerrold Ave., San Francisco, Calif. When inquiring specify CP 8071 on handy form opposite last page.

the versatile valves in the chemical field...

DeZurik

Easy-Operating, Non-Lubricated PLUG VALVES



Manufactured in

IRON or STEEL
BRONZE
ACID RESISTING BRONZE
NI RESIST
STAINLESS STEEL
HASTELLOY
MONEL
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ALUMINUM
and OTHER ALLOYS

On so many chemical lines . . . gas, liquid or dry solids . . . DeZurik Valves offer advantages found on no other valves. They're easier to operate—friction-free—only an e-a-s-y quarter-turn from wide-open to dead-shut. They're non-lubricated—no possibility of contaminating the flow—no "down time" for lube maintenance. They close tightly—without binding or sticking—without leaking! They are—without question—the versatile valves in the chemical field!

DeZURIK'S ***EXCLUSIVE ECCENTRIC PRINCIPLE***



The rubber-faced plug in a DeZurik Valve is eccentric in cross-section, matching the eccentric-raised seat. When closing the valve, the plug turns freely until the face touches the seat. The wedging action seals dead-tight. In opening the valve, the first movement of the handle unseats the plug and it swings aside smoothly . . . quickly . . . easily!

DeZurik Valves are available with manual, remote or automatic operation; in sizes ½" thru 20". Write for service recommendations and details. Representatives in principal cities.



DeZURIK SHOWER COMPANY
SARTELL, MINNESOTA

When inquiring check CP 8072 opposite last page



HOW DO YOU BENEFIT WITH KARBATE BRAND IMPERVIOUS GRAPHITE PROCESS EQUIPMENT?

ANSWER:

By using "Karbate" products, you can:

- **Eliminate corrosion, metallic contamination and the effects of thermal shock**
- **Utilize proved, rugged designs for long life, low maintenance**
- **Order standard stock items for lower cost, faster delivery**
- **Rely on service and application recommendations from National Carbon's technical staff**

Many features recommend "Karbate" chemical process equipment for a prominent place in your plant. Its low first-cost, long service life and freedom from mechanical troubles merit your *first* consideration — not only in those highly corrosive services where nothing else will do, but *wherever* corrosion is a factor.

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The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

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Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco
IN CANADA: Union Carbide Canada Limited, Toronto



When inquiring check CP 8073 opposite last page

One- and two-package coatings are neoprene-based, sprayable, and cure at room temps . . .

resist many chemicals over temperature range from −65 to 300°F

Uses: Both coatings are recommended for protection of process equipment, tanks, structural steel, refinery equipment, water condensers, and in marine applications. Two-package coating, however, is especially designed for immersion service over a wide temperature range.

Features: One-package coating may be applied to any surface and gives resistance to chemical spills, fumes, and drips within a temperature range of −20 to 275°F. Brushed-on coats give a dry film thickness of 4-5 mils per coat. Coating cures to a tough abrasion-resistant film. Excellent resistance is given to all chemicals except high concentrations of highly-oxidizing acids.

Two-package, room-temperature-curing chemical-resistant lining has an effective temperature range from −65 to 300°F. Brush or spray applications of this coating have been accomplished to give a film thickness of 20-30 mils per coat. It is possible with one coat of primer and two topcoats to develop rubber linings to tanks and equipment 60-65 mils thick.

Description: Both coatings, which are neoprene-based, cure at room temperature. They are unaffected by sunlight and weathering. One-package coating is available in standard colors of black, light grey, dark grey, red, and aluminum. Two-package coating is supplied in black, although special colors can be made up on orders of 50 gallons or more. Both coatings are packaged in one-gallon cans, 5-gallon pails, and 55-gallon drums.

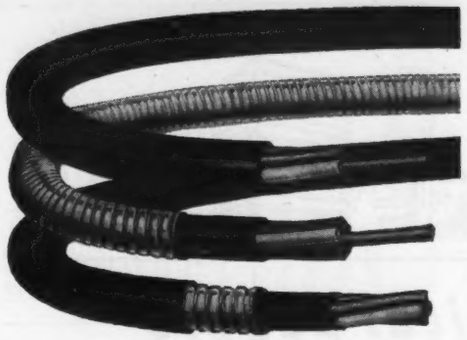
(One-package coating, Neocor C-10, and two-package coating, Neocor HD, are products of Corrosion Control Company, Inc., Dept. CP, 516 Fifth Avenue, New York 36, N. Y. . . . or for more information check CP 8074 on handy form opposite last page.)

Covers concentration of caustic by submerged combustion

Supplement included in 21-page submerged combustion application manual covers concentration of caustic by this procedure using hydrogen as a fuel. Supplement also describes asphalt heating and oxidation by submerged combustion.

Application manual may be obtained from Submerged Combustion Co., of America, Dept. CP, 759 Logan St., Hammond, Ind. When inquiring specify CP 8075 on handy form which is located opposite last page.

CRESCENT ARMORED MULTITUBE
In 3 Corrosion Resistant Types



For Pneumatic and Hydraulic Instruments and Control

TYPE CT—For damp or corrosive locations, where a moderate degree of mechanical protection to the tube is required. It employs a corrosion-resistant thermoplastic sheath, resistant to water, acids, alkalies, oil, and is flame-retardant.
TYPE CTA—Where maximum mechanical protection is desired during and after installation, such as direct burial in wet concrete and for pulling into conduit.
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CRESCENT ARMORED MULTITUBE consists of long-length tubes twisted together to permit bending without distortion. In each layer, one tube is a bright blue color, affording a fast means of identification from both ends.
Available in long runs from 2 to 19 tubes of copper, aluminum and polyethylene tubing in size ¼" O.D. This product is licensed under U. S. Patent No. 2,578,280.

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When inquiring check CP 8076 opposite last page

Aurora Vertical Sump Pumps are "TOPS"

HEAVY DUTY and LIGHT DUTY — **ALSO NON-CLOG SIZES UP TO 8"**



AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
62 LOUCKS STREET — AURORA • ILLINOIS

When inquiring check CP 8077 opposite last page

Recommended for sealing pipes carrying acids, alkalis, solvents

Thread-sealing compound of Teflon is recommended for pipes carrying volatile acids, alkalis, and solvents. Compound is chemically and biologically inert and can be used continuously with temps from −150 to 500°F. Pipes joined with this compound can be readily dismantled after intensive use.

(Gilbreth 18 Teflon sealing compound is a product of The Gilbreth Company, Dept. CP, 1211 Chestnut St., Philadelphia 7, Pa. . . . or for more information check CP 8078 opposite last page.)

Increased protection from corrosion — for floors . . .

material can be applied over concrete

Uses: For new as well as existing concrete floor surfaces.

Features: Floor material provides increased protection from alkalis, acids, and solvents. It furnishes abrasion-resistance two to four times as great as concrete and is four times as strong as concrete.

Description: Material is composed of three basic ingredients: 1) a thermosetting resin liquid, 2) a hardening agent, and 3) an aggregate filler.

Product is mixed at job site for immediate application. It handles like cement topping and is applied in thicknesses from ¼ to ⅜" maximum (per layer). Material cures in only a few hours to a dense, impermeable and nondusting surface. Adhesion is excellent.

(Coro-Crete floor material is product of The Ceilcote Co., Inc., Dept. CP, Ridge Rd., Cleveland 9, Ohio . . . or for more information check CP 8079 on the convenient Reader Serivce slip which is located opposite last page.)

New... FreeFlow GASKETS
made of* TEFLON

JOHN CRANE



FOR EVERY CORROSIVE SERVICE

"John Crane's" FreeFlow construction and chemically inert Teflon have been combined as *the* answer for gaskets in corrosive service. This new construction assures a flush fitting with the I.D. of the pipe and the inner wall of the Teflon envelope, not possible with the ordinary "wishbone" type gasket. (See drawing above).

This means elimination of:

1. Flow restriction and turbulence in the line.
2. Danger of rupture at high temperature due to entrapped air between gasket insert and Teflon envelope.

"John Crane" Teflon FreeFlow gaskets are impervious to practically every known chemical or gas and are unaffected by temperatures from −100° to +482°F., depending on the insert material. They are available in all shapes and sizes for a wide variety of applications, such as glass lined, porcelain, pyrex and similar equipment, including reactor kettles and pipes, distillation columns and nozzles.

Request full information on "John Crane" FreeFlow gaskets for your particular requirement. Ask for our informative booklet, *The Best in Teflon*, for other important technical and application data. Crane Packing Company, 1821 Cuyler Avenue, Chicago 13, Illinois. *In Canada: Crane Packing Co., Ltd., 617 Parkdale Ave., N., Hamilton, Ont.*

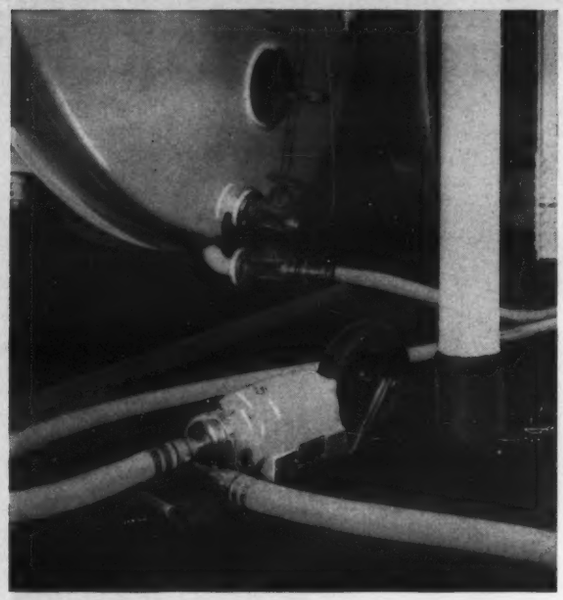


DEPEND ON "JOHN CRANE" TEFLON PRODUCTS

*DuPont trademark

JOHN CRANE **CRANE PACKING COMPANY** 38 YEARS INDUSTRIAL PROGRESS

When inquiring check CP 8080 opposite last page



How you can trim power bills with Cherry-Burrell "Flexflo" Pumps

You need less "motor" with "Flexflos" because their exclusive body design always delivers full-flow discharge with low friction losses. Less "motor" means lower initial cost, of course, as well as lower operating power costs.

Exclusive take-apart design permits disassembly in half a minute, including shaft seal. Easy assembly in one minute. All without tools. Stainless steel product contact surfaces. No packing.

Other Outstanding "Flexflo" Features

Sanitary: All contact surfaces of corrosion-resistant stainless steel.

Positive Sealing with less pressure, less wear, longer gasket life. No stuffing box.

Adjustable Outlet: Can be set in *any* position to fit every pipeline setup.

Full range of Sizes: From 5 to 240 g.p.m.; ¾ to 10 h.p. motors.

Stainless Tubing and Fittings, Too

We not only have as complete a line of stainless steel tubing and fittings as you can find *anywhere* . . . but also have them in stock for *immediate shipment* from a stock point near you—*wherever* you are.

Ask your Cherry-Burrell Representative about Flexflo stainless steel centrifugal pumps, tubing and fittings. Or write for literature.

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Equipment and Supplies for Industrial and Food Processing
SALES AND SERVICE IN 57 CITIES—U. S. AND CANADA

When inquiring check CP 8081 opposite last page

corrosion control



nace technical papers

The National Association of Corrosion Engineers held its Eleventh Annual Conference and Exhibition in Chicago on March 7-11. Forty-eight technical papers were presented. Of these, a dozen were selected by CHEMICAL PROCESSING as being particularly pertinent to its readers. Condensations of 3 appear on the next four pages. Condensations of the remaining ones will appear in the Corrosion Control section of future issues.

combating valve stem corrosion caused by packing

L. M. RASMUSSEN, *Chemical Engineer*
Manning, Maxwell & Moore, Inc.
Stratford, Connecticut

Need in the valve and pump industry for a specification to control corrosive agents in packing is explained in technical paper, "Corrosion by Valve Packing." Results of research work presented indicate that valve stem corrosion can be reduced by a packing treatment to remove soluble corrosives, incorporation of inhibitors or sacrificial elements, and careful selection of graphite dry lubricant in packing.

Problem of stainless steel valve stem pitting has been found to be a condition of storage. When a valve has been assembled and hydrostatically pressure-tested, the valve packing is saturated. A considerable period of time may elapse before valve is placed in service. During this storage period, corrosion in the form of pitting occurs. If the valve is placed in service immediately after hydrostatic testing, this condition does not occur.

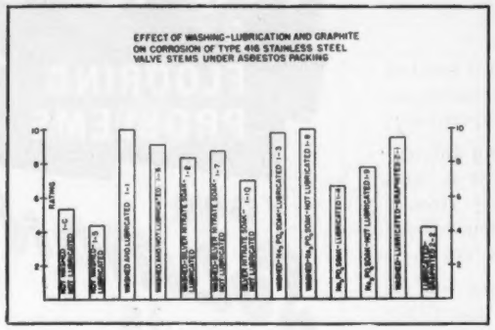
In the research program, asbestos-base packings were prepared, then washed and soaked in various solutions to remove corrosives such as chlorides. Test cells were then made up in which packing was placed around AISE Type 416 steel stem material. After hydrostatic testing at 1000 psi, cells were stored for 120 days. Surface of steel was then examined and rated by arbitrary index of 0 to 10, in which 0 represented 51 to 100% of surface area corroded while 10 indicated no visible corrosion.

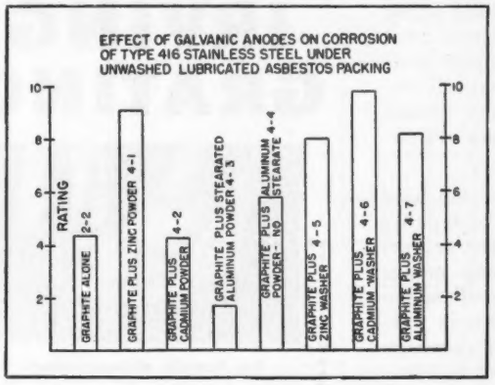
Similar tests were run in which sacrificial elements such as zinc or aluminum powder, or corrosion inhibiting salts were incorporated in packing. In other experiments different types of graphite dry lubricant were used in packing.

Test results appear to substantiate theory that a treatment to remove or inactivate corrosive constituents in packing is beneficial in eliminating or



Example of corrosion on valve stem after 120 days exposure to packing





retarding corrosion of valve stems. Choice of graphite can be important. Artificial graphite probably is not as corrosive to steel as natural graphite which contains mineral matter. Sacrificial metals included in packing construction were also shown to be effective in reducing corrosion.

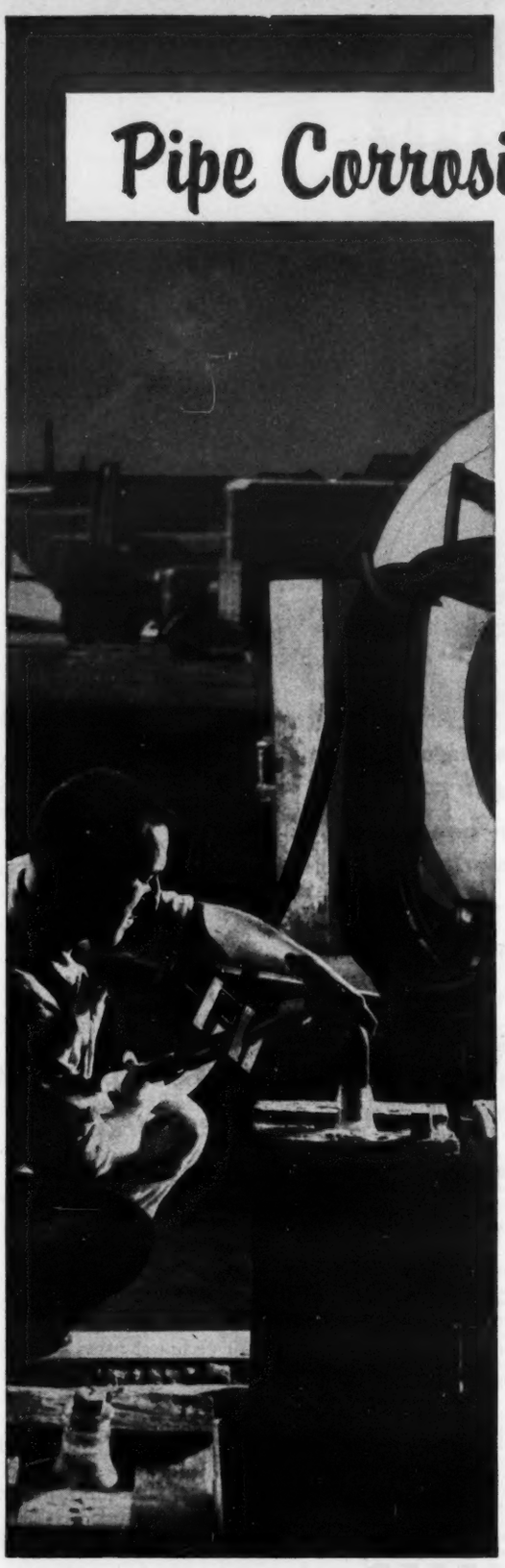
how to avoid metal pickup in high-purity water

W. Z. FRIEND
In charge Corrosion Engineering Section
Development & Research Div.
International Nickel Co., Inc.

Technical paper entitled, "Importance of High-purity Water Data to Industrial Applications," contains a considerable amount of information on materials that have been found satisfactory for use in handling high-purity water without metal contamination. In addition to being used in nuclear reactors, high-purity water is so extensively used in chemical processing operations that any data on it should be of wide interest.

High-purity water is known as "hungry water"

(*Continued on next page*)



Pipe Corrosive Chemicals through TYGON TUBING

Today's better way to conduct corrosive liquids or gases is with rugged, heavy-duty, TYGON TUBING. This flexible, plastic pipe, in sizes up to 2" ID, is used extensively as temporary or permanent acid and alkali lines; as inlet and discharge ports for chemical pumps and filters; as drainage and supply lines to and from reactors and storage tanks; and as a safe, efficient conducting medium in many other applications.

Available in six standard formulations to meet a wide range of chemicals and other operating conditions, TYGON TUBING, ranging from crystal clear to glossy black, is highly resistant to acids and alkalies, oils and greases, alcohols and water. Its minimum extractability permits use with the most sensitive solutions. Its smooth surfaces afford faster flow and quicker, easier cleaning. Its full flexibility makes even the most difficult installation simple. Its high strength, abrasion resistance, and non-aging characteristics insure long service life.

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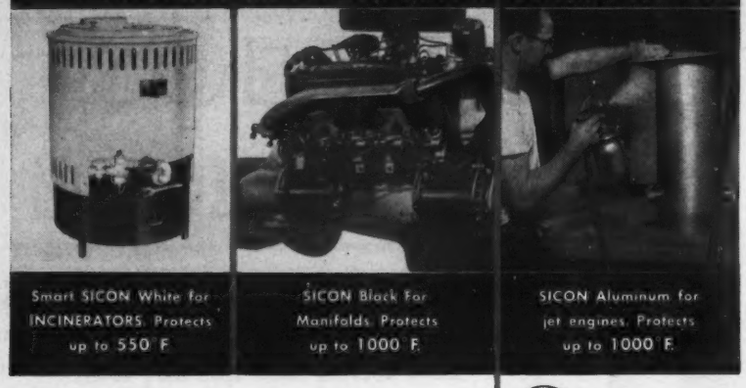
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When inquiring check CP 8082 opposite last page

152 Problems in HEAT RESISTANT FINISHES solved by Sicon

AMERICA'S FIRST AND FOREMOST SILICONE PROTECTIVE COATINGS



Smart SICON White for INCINERATORS. Protects up to 550°F

SICON Black For Manifolds. Protects up to 1000°F.

SICON Aluminum for jet engines. Protects up to 1000°F.

Shown above are examples of 152 product finish applications successfully solved by SICON last year after high temperatures had decomposed ordinary finishes. (See partial list below.)

The ease with which SICON can be applied—its remarkable film adhesion and stability under high heat without peeling, blistering, or losing gloss—accounts for its high preference for these products.

SICON can be formulated in smart decorative colors for use in the 550°F. range, and in aluminum or black in the 750-1000°F. range. Check the products below which are similar to yours. Complete technical data will be sent, together with latest brochure of case histories. Fill out and mail today.

New Brochure of Case Examples Now Ready

Sicon withstands up to 1000°F. without peeling or blistering.

EASY TO APPLY by Brush, Spray or Dip



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☐ Aircraft Parts	☐ Gas Ranges	☐ Pumps
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☐ Control Systems	☐ Mining Machinery	☐ Transformers
☐ Elect. Control	☐ Motor Bikes	☐ Tubing, Steel Welded
☐ Elect. Melting Pots	☐ Name Plates	☐ Turbo Dryers
☐ Electronic Equipment	☐ Oil Burners	☐ X-Ray Equipment

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When inquiring check CP 8083 opposite last page

NACE Technical Papers

(Continued from preceding page)

since it is anxious to reacquire the ions it has lost in purification processes. Hence, it is more corrosive than water containing normal impurities.

Term "high-purity" may mean something different according to the application in which it is used. Dissolved electrolyte content may vary from 5 down to 0.05 ppm and electrical resistance from 100,000 to 5,000,000 ohm-cm in various uses.

In many installations pure water leaving ion exchange equipment is handled without metal contamination in piping, valves, and pumps of rubber-lined construction. In some cases saran-lined piping and fittings are used. In one installation solid Uscolite pipe was satisfactory. A polyvinyl chloride sprayed-on lining in a 12" pipe prevented contamination at one plant. At another plant Transite pipe with vinyl chloride lining has given satisfactory service for four years.

Austenitic stainless steels, Types 304 and 316, have performed satisfactorily in handling high-purity water in a number of cases. Monel and Inconel have been used to advantage for lining storage tanks. Distilled water systems using aluminum tanks and tubing showed zero to insignificant pick-up of aluminum in the water. When aluminum tanks are used, they must be conditioned by filling and draining several times with tap water.

When used in power plant boilers experience has shown that stress corrosion cracking of steel can be made less likely to occur if pH of water is kept at 10.5 or above.

films, one-millionth inch in thickness, protect stainless steels

T. N. RHODIN, *Research Proj. Engineer*
E. I. du Pont de Nemours & Co. Inc.
Wilmington, Delaware

How ultra-thin films, often less than one-millionth of an inch in thickness, prevent corrosion is described in technical paper, "Oxide Films on Stainless Steels." These extremely thin films, associated with the passivity of stainless steels, are characterized by enrichment in silicon. (Silicon content is higher in the film than in the alloy.) Alloy compositions of Type 304 stainless steel which tend to develop films enriched in silicon were found to have superior corrosion resistance with respect to weight loss in 10% $FeCl_3$ solution at 25°C.

In the research work, oxide films were classified

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YOUR SOLUTION IS IRVING GRATING



For heavily abused areas:

IRVING Continuity Armouring

concrete-filled steel grating floor will not crack or break up. Inexpensive to install, it eliminates costly repairs AND IS SAFE.

Non-Sparking and Corrosion-Resistant **ALUMINUM GRATING**

extra-light, self-draining, self-ventilating, economical, strong and durable.

Perfect for Chemical Plants where fire is a hazard.

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Ask about

IRVING "GRIDSTEEL"

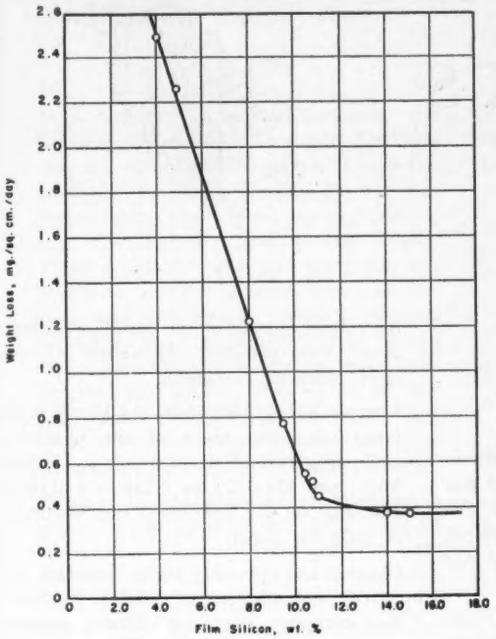
CONTOUR RETAINER MESH for Castable Ganister Linings used in refractionating units.

IRVING SUBWAY GRATING CO., INC.
ESTABLISHED 1902

OFFICES and PLANTS at
5050 27th St., Long Island City 1, N. Y.
1850 10th St., Oakland 20, California

When inquiring check CP 8084 opposite last page

NACE Technical Papers

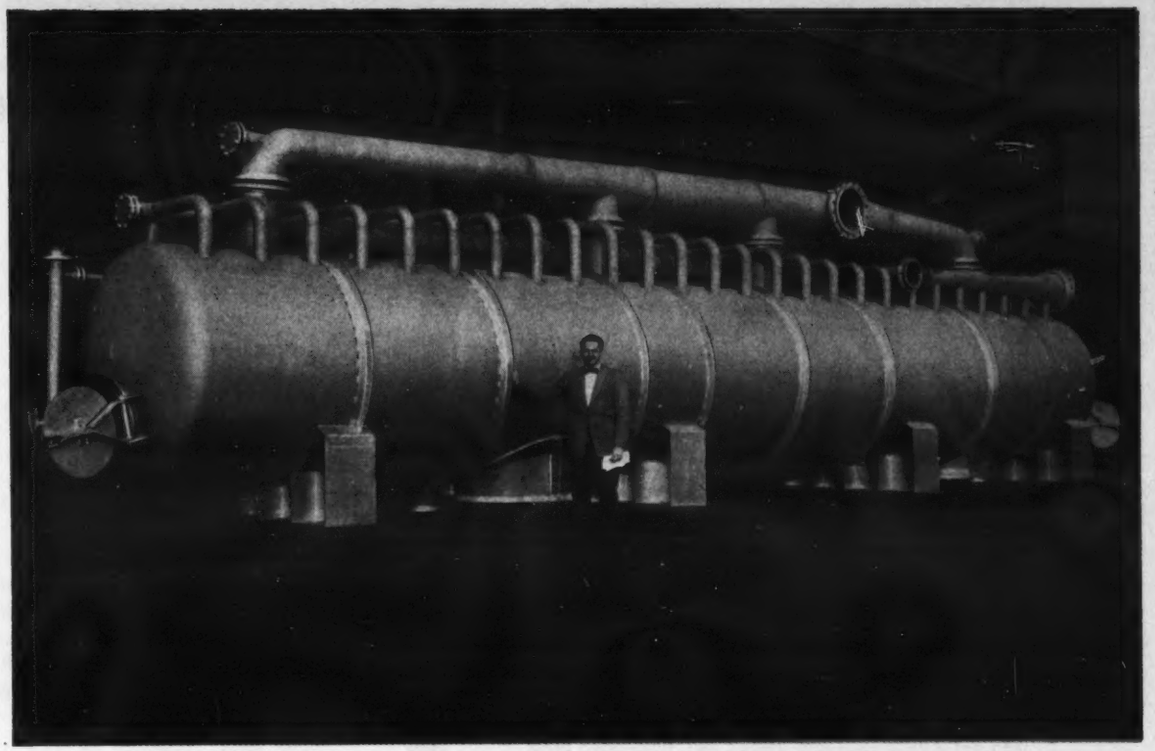


into three types according to the thickness, structure, and composition of the film and its resistance to corrosion. Composition of oxide films isolated from the surface of stainless steels were studied, using specially-developed microanalytical techniques. It is not a simple matter to isolate and analyze a film that may be only a millionth of an inch in thickness.

In one series of tests, commercial heats of typical 304 stainless steels were passivated in 5% HNO_3 — 0.5% $K_2Cr_2O_7$ solution and tested in 10% $FeCl_3$ solution at 25°C for 24 hr. Silicon content of alloys varied from 0.25 to 0.90% by weight. Composition of the films was determined and found to vary from 4 to 11%, depending on silicon content of alloy. A rapid increase in film silicon occurred as silicon in alloy increased from 0.25 to 0.60%, after which silicon in film increased at a reduced rate. This inflection in the curve corresponded to about 10% silicon in the film.

As shown in the accompanying table, corrosion rate as measured by weight loss decreased to 1/7th original rate as film-silicon increased from 3 to 14%. Corrosion that did occur at 14% was distributed over only half as many pits as at 3%.

It might have been anticipated that films enriched in chromium or nickel would be associated with the passivity of stainless steel. Although these elements are important film constituents, the principal characteristics of the ultra-thin films was enrichment in silicon. Results indicate the importance of having a minimum of 0.5% silicon in Type 304 stainless steel.



Receiver of type 304 Crucible Rezistal® stainless steel fabricated by O. G. Kelley and Company for the Rotareaed Corporation.

why it cost less to use stainless

This vessel improves the quality of paper stock. It is the receiver unit in the "Deculator" process, which removes all gasses from the wet stock in paper-making operations.

These receivers used to be made of carbon steel, lined with a phenolic resin. But the designers, The Rotareaed Corporation, wanted a material that could better withstand the highly corrosive nature of some paper stocks and the erosion that normally takes place within the receiver.

Then Crucible stainless steel, type 304, was tried. In the long run it proved to be less expensive. For stainless *fights* corrosion. Because it is almost impervious to oxidizing acids, it resists attack by corrosive paper stocks.

What's more, the erosion that used to be so costly in previous receivers has an insignificant effect on stainless. With its tough, abrasion-resisting surface, stainless often outlasts other metals scores of times in erosive or abrasive environments.

As a leading stainless steel producer, Crucible has much application and fabrication data to offer you. You'll find a great deal of this type of information in "Making the most of Stainless Steels in the Pulp and Paper Industry." Write for your free copy. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

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IN PECTIN EXTRACTION



One FEinc Continuous Filter Replaces Two Presses and Six Men

Looking at this clean, quiet picture, you'd never know this filtration job was formerly a hot, steamy mess, requiring six men per shift to load and unload wet, acid-laden press blankets, racks and press cars of two stop-and-go hydraulic presses.

Now it's a smooth-running, *really continuous* filtration operation, on this big FEinc String Discharge Filter. Only one operator is now required, with very little to do except watch the cake roll off hour after hour. Even the daily washup takes little time and effort.

Pectin recovery is reported to be as good as formerly. Losses due to leakage and spillage have been eliminated. The dynel cloth on this filter lasts more than a year . . . a substantial saving in the cost of filter cloth.

The pulp is lifted from the filter by continuous orlon strings . . . the famous FEinc String Discharge which successfully handles all types of cakes ranging from thin slimes to thick heavy sludges. There's no smearing, blinding or plugging of the fabric, and no loss due to "blow-back."

You too can improve production rates at lower cost in many of your filtration operations with the continuous . . . *really* continuous . . . FEinc String Discharge Filter. Find out more about what these versatile efficient filters can do for you. And ask about the new FEinc Horizontal Rotary Vacuum Filter for crystalline or fibrous pulps. Write today.

Ask for Bulletin 103



Filtration Engineers, Inc.

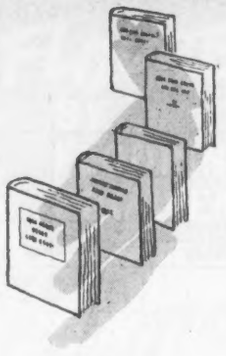
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Recent Books



Mass Spectrometry

Reviewed by B. F. DUDENBOSTEL, JR.
Esso Laboratories

This latest member of Methuen's Monographs on Chemical Subjects meets the fine standards set by previous books in this series. The author, A. J. B. Robertson, shows a well-rounded knowledge of the field of mass spectrometry.

The book, consisting of 135 pages, discusses the history of mass spectrometry, the principles of mass spectrometer operation, the ionization and dissociation of molecules induced by electron impact, chemical analysis by mass spectrometry, the investigation of free radicals, and the measurement of isotopic abundances.

This monograph serves excellently as an introduction to the field of mass spectrometry. It is well-written and well-illustrated. Obviously, it was not possible to cover the entire field of mass spectrometry in detail.

To obtain "Mass Spectrometry" remit $2 *direct to John Wiley & Sons, Inc., Dept. CP,* 440 *Fourth Ave., New York* 16, *N. Y. Specify CP* 8087 *opposite last page.*

Cellulose and Cellulose Derivatives Part II

Reviewed by E. E. DICKEY
Institute of Paper Chemistry

Part II of this comprehensive monograph, edited by Ott, Spurlin and Griffin, is divided into four chapters which cover the preparation and purification of cellulose, the properties and treatment of pulp for paper, and the preparation and properties of the important derivatives of cellulose. Chapter VI (pp. 511-588) by Holzer, Martin, Lewis and Wells, is a survey of the current sources of the world's cellulosic fibers with pertinent description of the chief processes employed.

Chapter VII (pp.589-619) by Hatch is an informative description of the bleaching and purification of wood cellulose. Chapter VIII (pp. 621-672) by Clark is a skillful discourse on the properties and treatment of pulp for paper.

Chapter IX (pp. 673-1055) includes reactivity and reactions of cellulose by Spurlin, inorganic esters by Barsha, organic esters by Malm and Hiatt, alkali and other metal derivatives by Nicoll, Cox and Conaway, ethers by Savage, Young and Massbert, xanthates by Kline, and degradation of cellulose derivatives by McBurney.

The improvements in the organization of the second edition are more apparent in Part II than in Part I, partly because of the added chapter (VIII) on the treatment of pulp as related to the properties of paper. The chapter on derivatives of cellulose (IX), almost a monograph by itself, appears to be unequalled in scope and content in describing this expanding group of materials.

To obtain "Cellulose and Cellulose Derivatives, Part II" remit $12 *direct to Interscience Publishers, Inc., Dept. CP,* 250 *Fifth Ave., New York* 1, *N. Y. When inquiring specify CP* 8088 *opposite last page.*

Reports on the Progress Of Applied Chemistry, Vol. XXXVIII

Reviewed by L. A. GUILDNER
Massachusetts Institute of Technology

This latest volume of the series is a continuation in form and general subject matter, and often of authors, of previous years. The field of chemical industry is discussed

reviews of current technical and reference works . . . summarized for you by authorities in the field working with the CP staff

in a series of review articles under the broad groupings of Fuel and Fuel Products; Organic Chemistry; Inorganic Chemistry, Biological Products; Textiles, Plastics, Adhesives and Paints; Food and Agriculture; and Chemical Engineering and Water. Those unfamiliar with this series may not expect to find the included topics of ferrous and non-ferrous refining, physical metallurgy and corrosion of metals. Certain topics are changed or covered only occasionally. For instance, this volume of 989 pages has a discussion of insulin, the first since 1944. However, in general, the scope of each of the *Reports* is about the same.

Written by specialists or members of a group of specialists in each field, some of the articles reflect a limited point of view in which only British practice is presented. This is particularly notable for topics where British problems and technology are peculiarly differentiated from more general worldwide practice.

Scientific workers in a large number of both engineering and research fields will find this series valuable as a concise summation of the journal publications for the year indicated for the volume — 1953. While the discussions present the principal results of the works cited, the bases of the conclusions are in general omitted and must be obtained from the references themselves.

To obtain "Reports on the Progress of Applied Chemistry, Vol. XXXVIII, 1953" remit $6.50 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N. Y. When inquiring specify CP 8089 on handy form opposite last page.

A Short Textbook of Colloidal Chemistry

Reviewed by L. A. GUILDNER
Massachusetts Institute of Technology

An introductory text is much enhanced by the meritorious manner of presentation. This volume by Jirgensons and Straumanis is excellent in its organization, its scope of coverage and the techniques of explanation.

The authors not only present the facts; they also teach. Subjects are introduced in their main import, and then the concepts are refined and sharpened. The sense of reality is maintained by the descriptions of laboratory and industrial procedures.

Three introductory chapters cover colloid chemistry "for readers wishing to acquire an acquaintance with colloid chemistry in a short time." The remainder of the book discusses first the physics and physical chemistry of colloids and then describes the behavior and types of colloidal systems in terms of fundamental properties. Treatment of so broad a field in 403 pages is necessarily brief, but it is effectively unified and extensive literature references are cited.

The authors state that "stress has been placed on basic facts and relationships, particularly in connection with practical problems, rather than on theoretical speculation." Their objective is sufficiently well achieved that reasonably little supplement should be necessary for any fundamental course, yet much material of applications interest is included. Well printed and bound, the book will serve well as a reference in libraries and as a text.

To obtain "A Short Textbook of Colloidal Chemistry" remit $8 direct to John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 8090 on handy form opposite last page.

Physical Chemistry

(Staff Review)

Designed as a textbook for a first year course in physical chemistry, this 671-page volume by Farrington Daniels, A.C.S. Willard Gibbs Medalist, and Robert A. Alberty, University of Wisconsin professors, appears to be thoughtfully written, easy to read, challenging, and thorough.

Mathematical derivations of formulas are given. Practical applications and example problems are presented. Many problems use typical lab data.

To obtain "Physical Chemistry" remit $6.50 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N.Y. When inquiring specify CP 8091 on handy form opposite last page.

Case Study No. 111

N. J.

NEW JERSEY FIRM
OVERCOMES
TOUGH EVAPORATOR
PROBLEM
with INTERNAL Hi-eF PURIFIERS

EQUIPMENT REQUIRED:

Eight Internal Hi-eF Purifiers (Type IMS-16 Monel Construction) were originally installed by this New Jersey firm for a difficult distillate evaporator service. These units proved so efficient in preventing carryover from leaving the evaporators that four additional Hi-eF Purifiers were installed.

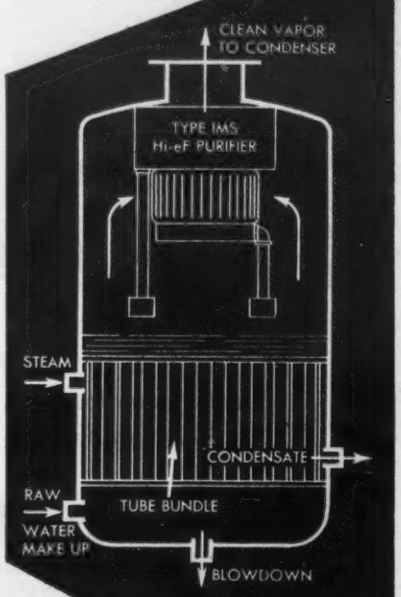
SERVICE:

These Hi-eF Purifiers are installed in the vapor chamber of a salt water evaporator where they effectively remove entrained brine from the water vapor before it is delivered to the condenser in the fresh water system. Each Hi-eF Purifier handles 4000 #/hr. vapor at 22" to 27" mercury vacuum, and delivers vapor which contains not more than 0.22 grains (3.8PPM) of chlorine per gallon of distillate with a shell concentration of 1.5/32nds salinity (40,000 PPM).

Distillate purity is automatically controlled by means of an electronic detector. This control device would open a bypass valve and dump the water if the concentration ever exceeded 0.25 grains/gallon.

RESULTS:

The company reports that the Hi-eF Purifiers operate well within the limits of the rigid purity control maintained over the purifiers by means of the electronic detector. The fact that this New Jersey firm has reordered four additional internal Hi-eF Purifiers is proof in itself that Hi-eF Purifiers soon pay for themselves in evaporator service and are extremely efficient in preventing carryover.



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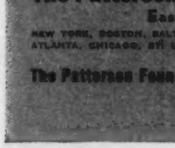


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Richard L. Cameron
President

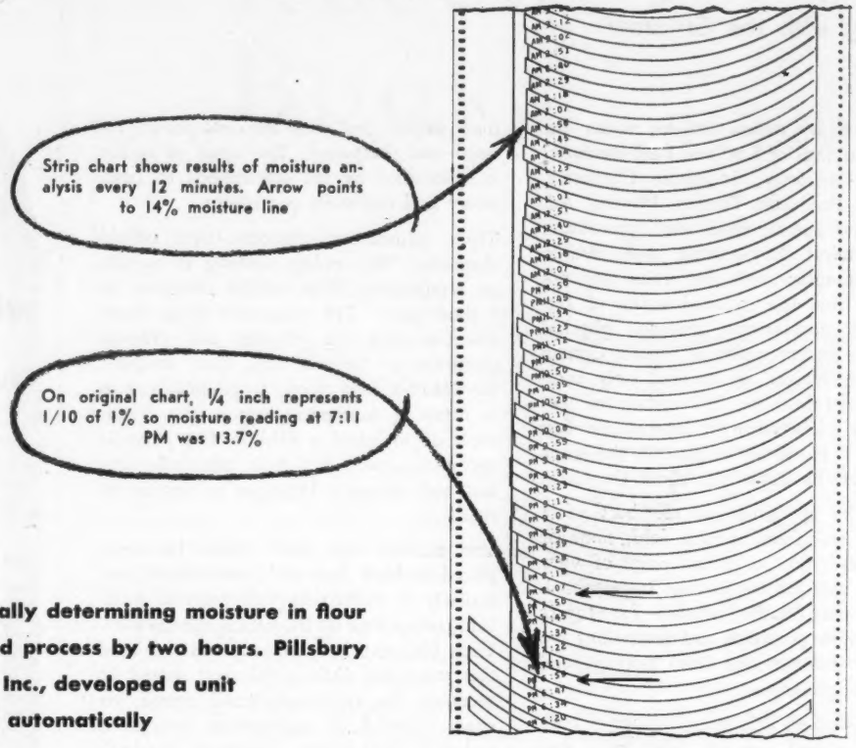


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ideas — from other industries and the AEC . . .
new trends in research, processes, services



Manually determining moisture in flour lagged process by two hours. Pillsbury Mills, Inc., developed a unit which automatically

samples, tests, records moisture analysis every 12 minutes

Moisture is determined with accuracy of ± 0.1% and recorded with time and date

Until two years ago, Pillsbury Mills, Inc., Minneapolis, Minn., used conventional method for determining moisture content of flour. Approximately two hours were required to complete each test. As much as 63,000 lb of flour could pass through the milling process during that time. By the time manual test results were received, moisture content could be standard or could be worse. Operator only knew if moisture had been off two hours previously. Correction at that time might correct the trouble . . . or might over-correct.

Moisture content is now measured and recorded automatically every 12 minutes. Finished flour is fed through Teflon-lined chute onto scale pan. Sample is exactly ten grams. An alarm sounds to indicate trouble if more than two minutes elapse before the ten-gram sample is accumulated in scale pan.

Sample is dried in approximately five minutes and is again weighed. Exact loss of weight ± 0.1% is recorded together with time and date. Sample is then automatically discarded and timer starts cycle again.

Use of automatic testing and recording has reduced analysis time from two hours to 12 minutes. Human error present in manual analysis has been eliminated.



Operator observing strip chart which indicates moisture content of flour. Moisture test is completed every 12 minutes

Rapid and accurate detection of moisture fluctuations and prompt remedy has resulted in improved quality control and operation. Operator is furnished a running record which enables him to recognize when he should add water to wheat before milling. Operator is also given data required to make minor adjustments in humidity of mill.

Tester provides permanent chart record of every moisture condition existing in stream before finished flour is passed to storage bins.

(Continuous moisture tester — illustrated in article — is pilot model, was developed by Pillsbury Mills, Inc., and C. W. Brabender. Brabender Corp., Dept. CP, 224 Saddle River Rd., Rochelle Park, N. J. is licensed and is building and selling a production model . . . for more information check CP 8094 on handy form opposite last page.)



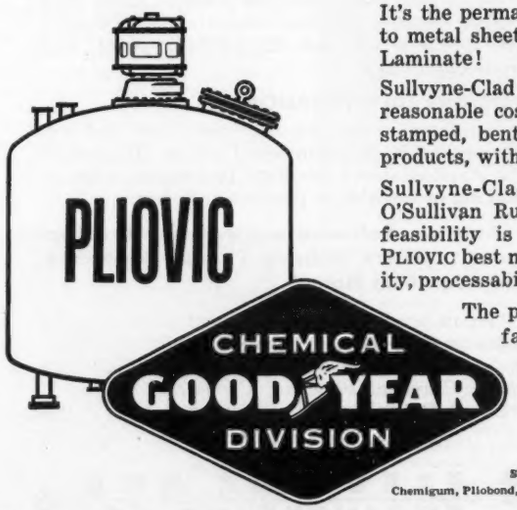
Put your finger on ideas

. . . materials, equipment and services through our handy Product Directory, starting in this issue on page 185. This "quick-locator" lists all products, with page references.



Photo courtesy O'Sullivan Rubber Company, Winchester, Va.

A wedding that could affect you!



It's the permanent mating of smooth or embossed vinyl sheeting to metal sheeting in a new basic material – Sullvyne-Clad Metal Laminate!

Sullvyne-Clad combines the best properties of both materials at reasonable cost. It's a prefinished sheet which can be punched, stamped, bent or otherwise formed into a wide range of metal products, without damage to the bond or covering.

Sullvyne-Clad results from a precise process developed by O'Sullivan Rubber Corporation. A big factor in its commercial feasibility is PLIOVIC – the easy-processing polyvinyl chloride. PLIOVIC best meets the necessarily tight specifications on uniformity, processability, heat stability and freedom from gel particles.

The particular PLIOVIC used in Sullvyne-Clad is one of a family of resins designed and made to meet the increasing demand for easy processability without sacrifice of physical properties. How can they help you? For details, write: Goodyear, Chemical Division, Dept. G-9435, Akron 16, Ohio.

Sullvyne-Clad—T. M. O'Sullivan Rubber Corporation, Winchester, Va.
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A-C. MOTORS

All new Reliance A-c. Motors provide these two essentials to trouble-free operation in hazardous or corrosive atmospheres . . .

POSITIVE PROTECTION

A pure neoprene gasket encloses each lead wire with an individually molded pressure knob. This gasket forms a positive protective seal between the motor frame and the corrosion-proof, cast iron conduit box.

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Numbers on the pressure knobs and lead lugs correspond with a numbered wiring diagram on the stainless steel nameplate. Identification for installing or rewiring is positive and easy.

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RELIANCE ELECTRIC AND ENGINEERING CO.

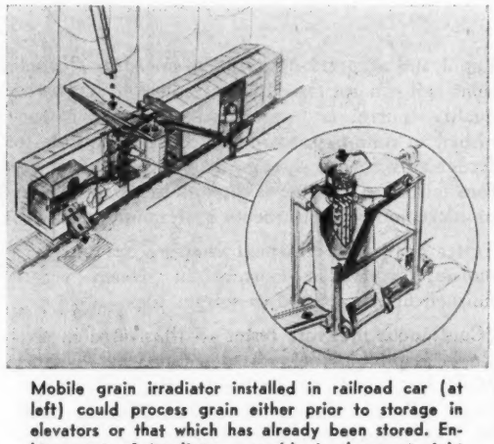
When inquiring check CP 8096 opposite last page

Preliminary designs completed for crop irradiation equipment

both mobile and fixed units show possibilities

Preliminary designs of possible equipment for irradiation of grains and potatoes were shown at the atomic energy conference sponsored in April by Stanford Research Institute and the Atomic Industrial Forum. Equipment, using gamma radiation produced by a cobalt-60 source, will eliminate, it is hoped, an estimated average annual grain loss of approximately 150 million bushels, valued at $250 million. It has been established that by such radiation, insect pests in grain can be destroyed or made sterile, and sprouting or germination of potatoes, onions, and other tubers can be prevented without damage or change in flavor or appearance.

Two designs are a possibility — mobile and fixed. The mobile irradiator might be built into a railroad car for treatment of grain at the elevator. It could also be installed in a trailer truck for processing



Mobile grain irradiator installed in railroad car (at left) could process grain either prior to storage in elevators or that which has already been stored. Enlargement of irradiator assembly is shown at right

crops which may have to be stored in open fields or storage warehouses. The fixed irradiator is designed for use permanently within a grain elevator and provides a convenient and simple way of treating grain being unloaded from ships or railroad cars.

Genetic studies at Brookhaven Laboratory have proved that very small radiation doses would be required to achieve the desired results. Shielding on the equipment would be sufficient to keep radiation level on outside of shield within safe limits.

(Designs were prepared by American Machine and Foundry Co., Dept. CP, AMF Building, 261 Madison Avenue, New York 16, New York. Check CP 8097 opposite last page.)

National air pollution abatement committee proposed . . .

could serve in advisory capacity to the President

Because of the increase in non-industrial air pollution, it has been proposed that a national air pollution abatement committee be established. Made up of state and federal officials and industry representatives, the committee could perhaps serve in an advisory capacity to the President.

Advantages of such a group would be as follows:

1) Industry support to pollution effort could be coordinated.

2) With delegates from individual states and cities, local interests would be appropriately represented.

3) Effort of Federal government from both point of view of national health and the fact that the air is a resource would find a place through which it could achieve implementation and active support.

4) Group could establish patterns to serve as guide for local regulations.

5) Research activities on subject could be guided with minimum of duplication.

6) Factions now existing would have meeting place for settling of differences in conference.

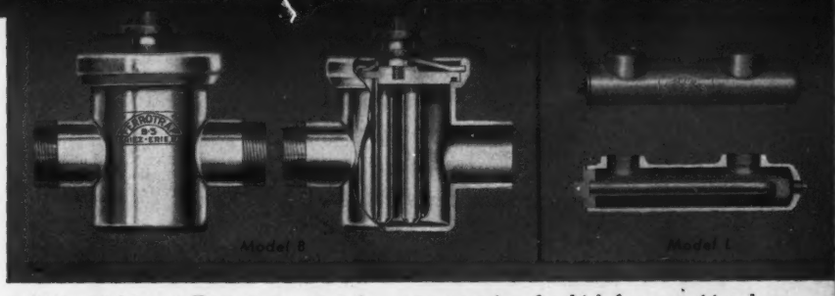
7) Committee would provide a vehicle not only for collection of information on the subject, but also for a national public information effort.

(Condensed from speech made before Third National Air Pollution Symposium, by Mr. William C. Foster, President, Manufacturing Chemists Association, Dept. CP, 1625 Eye Street, Northwest, Washington 6, D. C.)

For more information on product at right, specify CP 8098 . . . see information request blank opposite last page.

IRON contamination in LIQUIDS and DRY materials eliminated by New ERIEZ MAGNETIC SEPARATORS

New – Eriez Permanent Magnetic FERROTRAPS for *Liquids!*



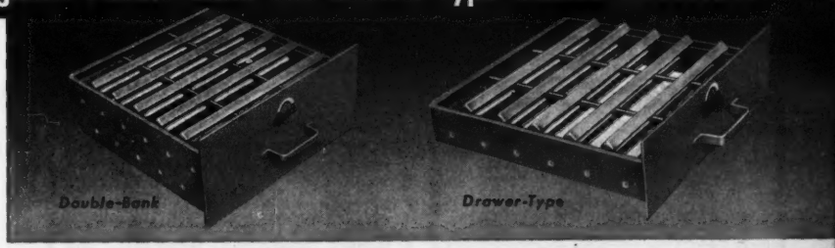
Offer 300%-400% More Magnetic Working Area Than Many Old-Style Magnetic Traps

The new line of Eriez Magnetic Ferrotraps (Pipeline Traps) offer manufacturers protection against damaging fine and tramp iron contamination like they've never had before! Designed for efficient removal of unwanted iron and fines from almost all types of liquids flowing through pipelines, Ferrotraps protect costly screens, pumps, mixers, etc., and prevent ferrous contamination of the product. They are invaluable where product purity is of prime importance, in such applications as foods, drugs, beverages, chemicals, cosmetics, paints, etc.

Quickly installed in any position in new or existing equipment, Ferrotraps magnetic strength is guaranteed indefinitely. Powerful magnetic unit is easily removed and cleaned; no muss, no small parts to lose. Model B, all stainless steel construction, has been built for standard or sanitary applications and is available for 2", 3" and 4" pipelines. Magnetic element consists of multiple fingers, positioned so that the flow of liquid impinges against it. Model B offers utmost protection, while Model L, with one long magnetic element (all-bronze housing), provides good protection at low cost. Model L is adaptable to pipelines from ½" to 2". Both models withstand pressure of 150 psi.

For complete information about both models, request Bulletin B-605.

New – Eriez Permanent Magnetic Double-Bank and Drawer-Type GRATE MAGNETS!



For Free-Flowing Choke and Surge Fed DRY Materials

Designed for removing tramp iron and fines from free-flowing dry materials such as grains, coffee, dried fruits and foods, tobacco, pelleted products, etc., Eriez Grate Magnets now are available in single or double-bank units in wing and drawer types. In double-bank unit, second row of magnetic tubes is placed directly under open spaces of top row for increased efficiency. Protective iron grill guides flow of material onto powerful magnetic tubes. For use in floor openings, regular or odd-shaped hoppers, chutes and ducts. Intensive magnetic barrier does excellent job of removing iron contamination.

For installation in vertical *closed* chutes and ducts, Eriez Drawer-Type Grate Magnets offer highly efficient protection plus roll-out convenience. Single or double-bank units. Entire separator glides out on metal slides for quick, easy cleaning. Installation is fast and simple . . . latch (furnished) and gasket make dust-tight installation.

Eriez Grate Magnets, wing-type and drawer-type, come in 162 sizes, from 2½" x 4", to 36½" x 36". Special sizes made to order. Complete line is available in all-stainless steel construction. For additional information, request Bulletin B-214.



NOT NAILED TO THE FLOOR! Here's an idea for publicity men who used to create "gag shots" by nailing down shoes. Just use a piece of iron on the heel of the shoe and an Eriez magnet under the rug. To industrialists, however, this demonstrates another idea — powerful magnetic action which can quickly be put to work pulling dangerous tramp iron out of processing lines . . . tramp iron which causes fires, machinery damage and product contamination. *All Eriez Magnets are non-electric, self-contained. They operate without wires or attachments. Best of all their magnetic power lasts a lifetime. The first cost is the last.*

● *Eriez' free booklet "Magnetic Ideas" can help you. Send for it without obligation,* **ERIEZ MANUFACTURING COMPANY, 73-U Magnet Drive, Erie, Pa.**
OR on your specific request Eriez factory-trained field men backed by Eriez' laboratory and engineering know-how, will be happy to study your particular problem, make a plant survey and offer helpful "Magnetic Ideas."

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When inquiring check CP 8099A opposite last page

Flash-smelting process slashes the costs of Cu refining

by-product furnace gas source for liquid SO_2

Oxygen flash-smelting process for treating copper concentrates is reported to reduce copper smelting costs and permit large-scale production of liquid sulfur dioxide from resulting high-quality by-product furnace gas. Process eliminates use of fuel normally used for smelting.

In the process, finely-divided copper concentrates and flux are dried and injected with oxygen into a preheated smelting furnace to produce matte, slag, and a gas containing about 75% sulfur dioxide. In the furnace, oxygen combines with some of the sulfur and iron of the chalcopyrite (copper-iron-sulfide), forms SO_2 and iron oxide.

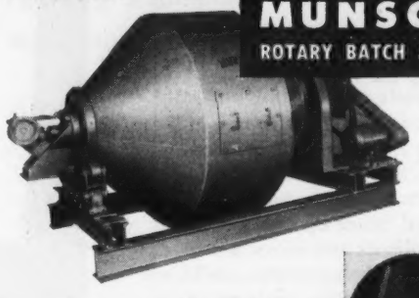
Heat of reaction is sufficient to melt residual copper-iron-sulfide to form a matte, and the iron oxide combines with siliceous flux to form a slag. Feature of process is method of cleaning copper-rich slag by flash-smelting pyrrhotite at skimming end of furnace. Slag is showered with iron sulfide droplets which, in settling into matte beneath, extract copper from slag.

Flash-smelting furnace gas is water-scrubbed and treated by a wet Cottrell before it is converted into liquid sulfur dioxide. Production of latter involves drying cleaned gas with sulfuric acid, then compressing and cooling gas to condense the sulfur dioxide.

Low-cost oxygen used at Canadian plant is produced by tonnage oxygen unit known as Oxyton (built by Canadian Liquid Air Company). Unit produces 325 tons of 95% oxygen every 24 hours. Flash-smelting furnace at plant is 68′ long, 24′ wide, and 17′ high at the ends, outside its steel casing. Smelting capacity is about 1000 tons of dry solid charge per day.

(Oxygen flash smelting process is development of The International Nickel Company, Inc., Dept. CP, 67 Wall Street, New York 5, New York.)

For faster, more accurate blending of dry ingredients ...make it a MUNSON ROTARY BATCH MIXER



Unequalled for dry mixing of chemicals, insecticides, powdered metals, fibrous materials, fertilizers, gelatin, glue, soap compounds, etc. Available in capacities from 20 to 250 cu. ft. Provides faster, more accurate blending, yet will not grind or reduce size of particles. Can be fitted with internal spray for introduction of limited amount of liquid.



EXCLUSIVE MULTIPLE-BLENDING ACTION

Lifters cut out and lift ingredients. Rotating cone tumbles stock. Empties *completely* after every mix.

Write for Details

MUNSON MILL MACHINERY CO.
Dept. P-755, Utica, New York

When inquiring check CP 8100 opposite last page

INSTALLS IN MINUTES! OPERATES IN SECONDS! DELIVERS YEARS OF MORE EFFICIENT FILTRATION!

New
SPERRY "HANDRAULIC" FILTER PRESS CLOSING DEVICE



Replaces the filler block . . . without alterations or extra space . . . to provide the speed and ease of hydraulic control in a low-cost manually-operated Closing Device. It's the newest member in Sperry's family of custom-engineered Filter Presses and auxiliary equipment. See the complete line in Sperry's big new catalog. Send for your free copy today.

Eastern Sales Representative: George S. Tarbox, 908 Nepperhan Ave. Yonkers 3, N. Y. Yonkers 5-8400

Western Sales Representative: B. M. Pilhashy, 833 Merchants Exch. Bldg., San Francisco 4, Calif. DO 2-0375

SPERRY FILTER PRESSES 58

D. R. SPERRY & CO., BATAVIA, ILL.
Filtration Engineers for More Than 60 Years

When inquiring check CP 8101 opposite last page

Mobile electrostatic precipitator strips 99% dust, pollen, smoke from room air . . .

unit's charged metal plates trap micron-size particles

Mobile electrostatic precipitator is reported to be able to remove more than 99 per cent of all smoke, dust, pollen, and even some bacteria from room air. Developed originally for relief of sufferers from hay fever, asthma, and other allergies, machine is finding increased uses in industry. Dust-free uncontaminated air, a "must" in many industrial and scientific activities, is produced easily, at low cost, by the device.



Almost sterile atmosphere is produced by mobile electrostatic precipitator. Mounted on casters, unit requires no installation, plugs into wall outlet

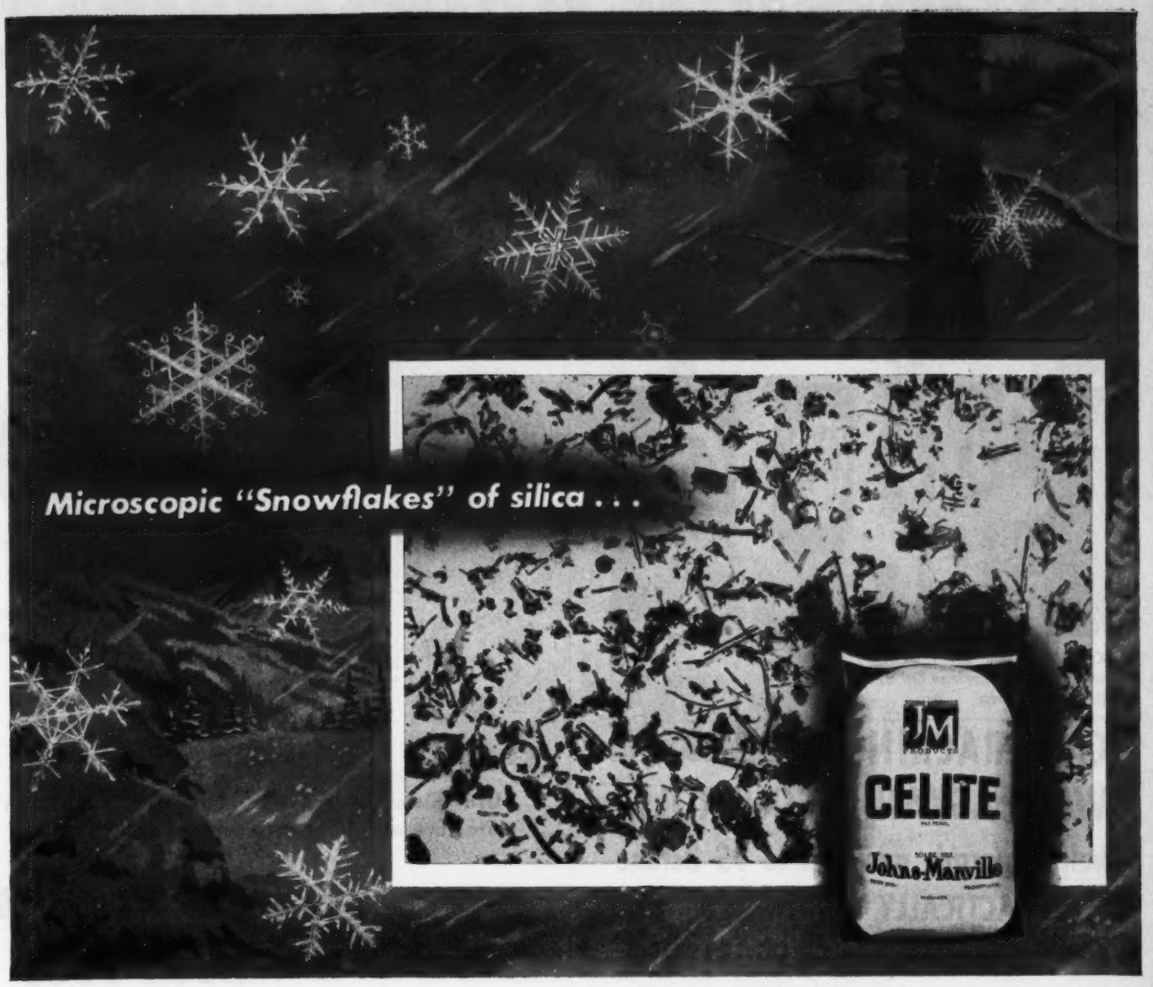
The "Micronaire" cleaner removes airborne particles by a form of magnetic attraction. Micron-size particles are trapped by charged metal plates. Plates are easily removed and washed under a faucet when collection of dust gets too thick. Cleaning is performed about once every two weeks. Machine can be wheeled into any area, plugged into wall outlet, and put to work.

(Mobile electrostatic precipitator is product of Raytheon Manufacturing Company, Dept. CP, 90 Willow Street, Waltham, Massachusetts . . . or for more information check CP 8102 on handy form opposite last page.)

Questions and answers about Defense Materials System

Key questions and answers on essential points of the Defense Materials System are presented in 41-page booklet. Detailed description of the system and instructions for defense contractors are also included.

To obtain "The Defense Materials System in our American Industry", remit 25c direct to Business and Defense Services Administration, General Industrial Equipment Division, US Department of Commerce, Washington 25, D. C.



Celite's diatomite structure steps up performance

in paints—plastics—polishes . . . hundreds of other products

MICROSCOPIC PARTICLES of Celite* do a man-size job of stepping up performance for many of America's leading products. Here is how the unique structure of Celite Diatomite Powders may add more beauty, longer life, greater efficiency to *your* products, too.

For example, the spiny, irregularly shaped particles contribute surface characteristics which make them the outstanding flatting agent in paints. Again, because of their structure, Celite particles are widely used as a mild, non-scratching abrasive in finest quality auto, silver and glass polishes. Or consider molded plastics, where the strength and durability of Celite particles add life and beauty to surface finish.

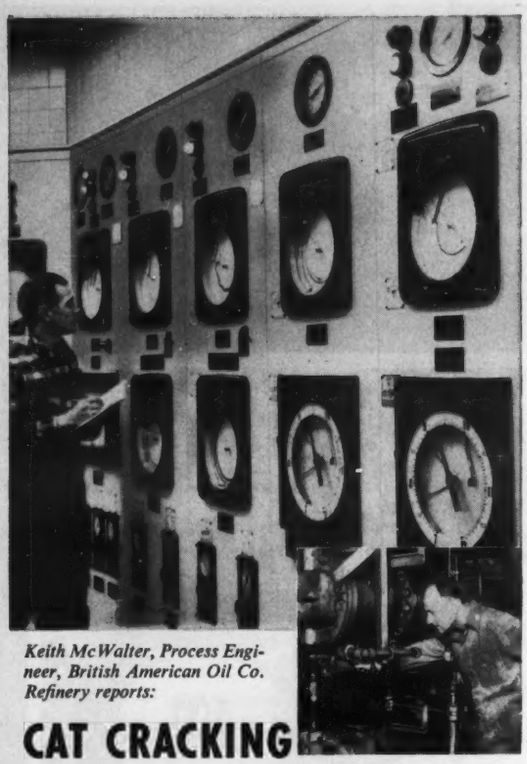
Moreover, Celite particles in mass have great bulk per unit weight, so they are invaluable for extending, dispersing or fluffing up dry powders. They have high absorptive capacity, too, so they keep powders free-flowing, they serve as a medium for shipping or storing liquids in a dry form.

Which of the many Celite advantages can you use to build product performance or cut production costs? A Johns-Manville Celite Engineer will gladly discuss your problem, without obligation. For his services or more information, simply write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.

JOHNS-MANVILLE JM PRODUCTS **Johns-Manville CELITE** INDUSTRY'S MOST VERSATILE MINERAL FILLER

When inquiring check CP 8103 opposite last page



Keith McWalter, Process Engineer, British American Oil Co. Refinery reports:

CAT CRACKING WITH ASKANIA CONTROLS

helps upgrade gasoline to 95 Octane ...PRACTICALLY ELIMINATES COSTLY MAINTENANCE PROBLEMS

Six years of maximum operating efficiency without a single failure! That's the enviable record of Askania control systems used on fluid bed catalytic cracking units at the British American Oil Refinery in Montreal, Canada.

Says Process Engineer Keith McWalter, "To achieve maximum operating efficiency and control over the bed level, pressure and catalyst flow, Askania controls were installed on all slide valves in the flue stack and on the turbine blower unit of our 'cat-cracking' unit. That was nearly 6 years ago and up till now, we have had nothing but optimum service from the control units."

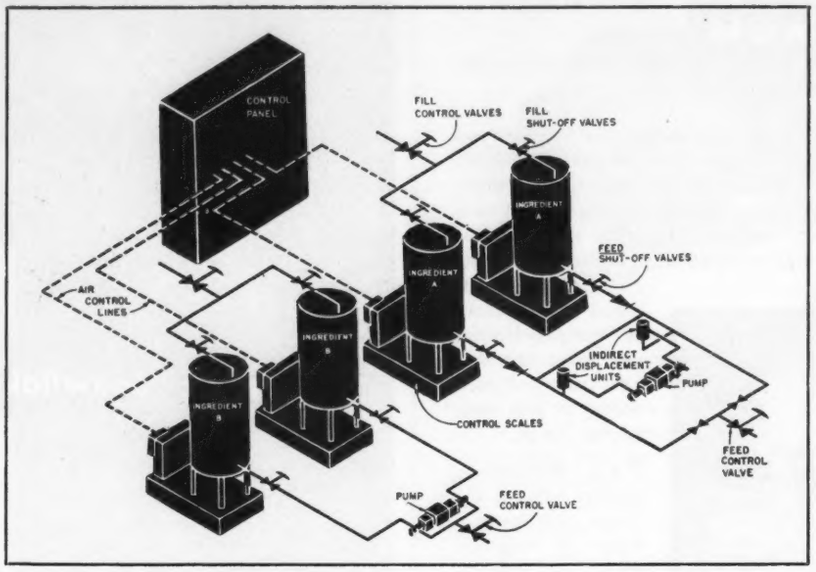
Askania Controls are currently solving problems in many different industries. If you have control problems that are boosting your costs or lowering your product quality, Askania can help you. *Write for bulletin No. 188.*

ASKANIA REGULATOR COMPANY
242 E. Ontario St. Chicago 11, Illinois
SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION



When inquiring check CP 8104 opposite last page

instrumentation & control



Uses piston of water to pump raw material in manufacture of rubber accelerator for . . .

better blend accuracy with less attention

Problem: Despite extreme care and precautions used in accelerator blending operation at Pathfinder Chemical Co., Niagara Falls, N. Y., engineers were not satisfied with accuracy. One operator read volume of ingredients in blending tank; another controlled feed pump manually to reach desired blend.

Four materials had to be brought together in this operation. Three were liquid, the other solid. Liquids were low viscosity, non-corrosive.

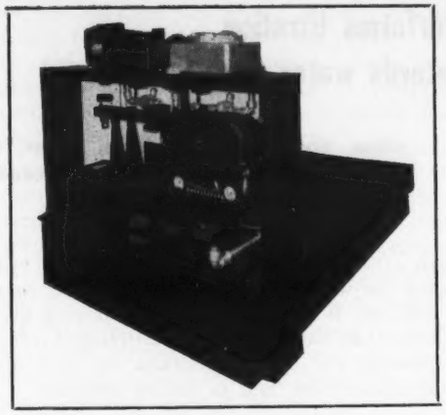
Solution: In mid-1954 blending operation was made automatic. Two of the liquids were preblended using rotameter checks of specific gravity for control. Solid was dissolved in the other liquid. Solid-liquid ratio in this stream was conveniently controlled by tank batching. Final blending took place through a loss-in-weight proportioning system.

One not-too-obvious drawback in this method came from the liquid-solid solution. Liquid in this stream was quite volatile and continually evaporated on piston of proportioning pump. This left an abrasive coating of solid to score pump's cylinder. Coupled with a 1000 psi pressure, the situation spelled leaks galore.

In place of older procedure where one of two pumps delivered more than was needed and control was maintained by varying its by-pass, reciprocating pumps with speed variation are now used. Both are hydraulically operated with fixed stroke length. Capacity is varied by speed change dictated by process demands as indicated by control system which measures weight withdrawn from supply tanks.

In order to get around evaporation on the piston and scoring, one of these pumps is equipped with indirect displacement units. These are water-filled "cushions" between pump itself and the material to be pumped. Water is moved by pump's piston and this water acts as a piston on water-insoluble material.

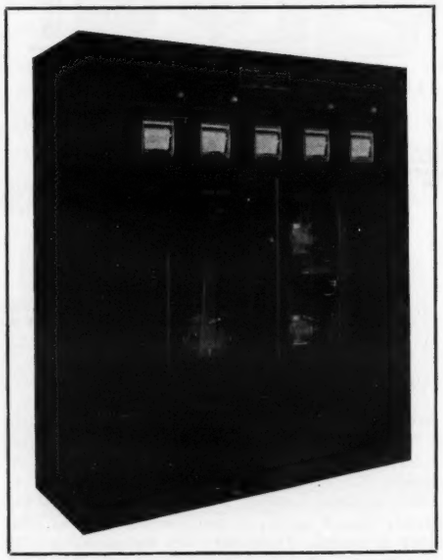
Since control is maintained by loss in weight, no



Tanks holding ingredients are supported on scales like this

corrections are needed for temperature, viscosity, etc. Electric drives move counterpoise on scale beam at a predetermined rate. Whenever tank contents outweigh this setting, pump speed is increased to catch up. Retraction of the poise is governed by an accurately machined screw. A pneumatic controller senses movements of beam.

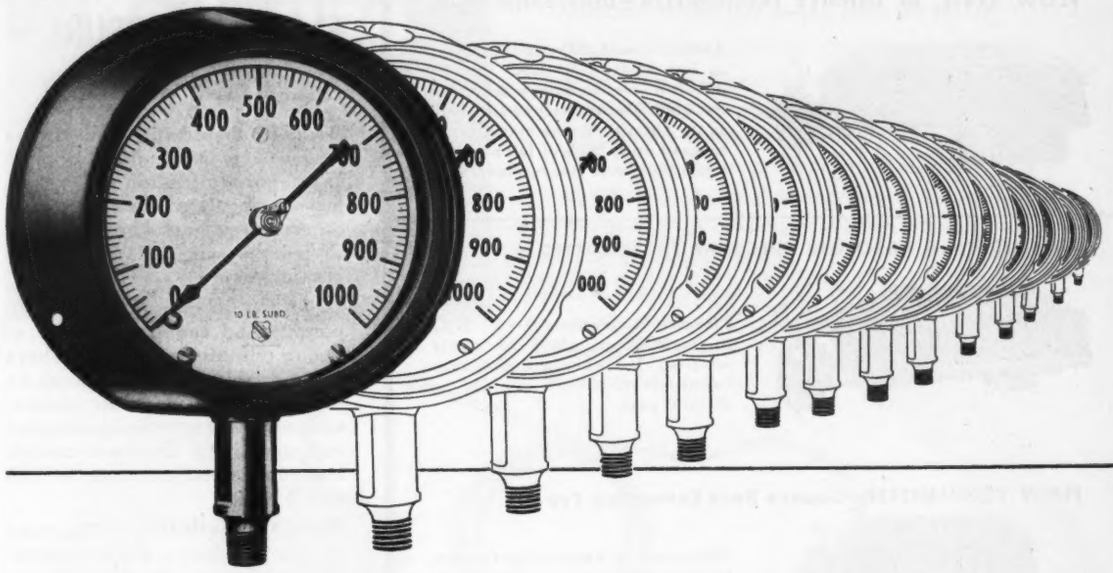
Results: Once indirect displacement with water was put into operation, no other serious operational problems came up. Accuracy has improved, is now adequate. One operator can handle this entire blending operation if need be.



Master control panel shows contents of each tank and also rate of total blended stream

(Loss-in-weight proportioning system was furnished by Proportioneers, Inc., Dept. CP, a division of B-I-F Industries, 345 Harris Ave., Providence 1, R. I. Check CP 8105 opposite last page.)

SATISFACTION MULTIPLIED
3x8x8x38x2x5



Service Conditions primarily determine the pressure gauge you specify for your installation. The wrong gauge can cost time, trouble, and money.

That's the big reason why Ashcroft Duragauges make sure of your complete satisfaction by offering a multiple choice in case designs and materials, Bourdon tube materials, ranges, movements, and dial sizes. Briefly, you can select the right gauge for your requirements from:

Cases of 3 different materials in 8 service-proved designs.

Bourdon Tubes of 8 different types of metals to meet specific service requirements.

Pressure Ranges from 30" vacuum or a few ounces through 100,000 psi.

Rotary Geared Movements that include the famous "Nylon Movement" or all stainless steel.

Dial Sizes from 4½" through 12".

Most important, Ashcroft Duragauges provide that unbeatable combination of highest sustained accuracy and durability of any pressure gauge built.

TAKE ADVANTAGE of the counsel of your nearby Industrial Supply Distributor. You can count on him to help you select Ashcroft Duragauges that will serve better and longer, with minimum maintenance, no matter how severe the conditions of vibration, pulsation, corrosion and weather.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario*

ASHCROFT GAUGES

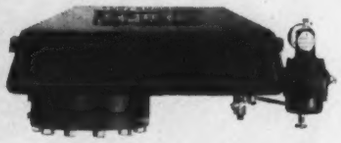
A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, *Stratford, Conn.* 'HANCOCK' VALVES, *Watertown, Mass.* 'CONSOLIDATED' SAFETY RELIEF VALVES, *Tulsa, Oklahoma.* AIRCRAFT CONTROL PRODUCTS, *Danbury & Stratford, Conn. and Inglewood, Calif.* "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, *Muskegon, Mich.*

When inquiring check CP 8106 opposite last page

Here's Force-Balance* Accuracy and Ruggedness in a Complete Line of Pneumatic Transmitters . . .

FLOW, LEVEL, or DENSITY TRANSMITTER—Differential Type



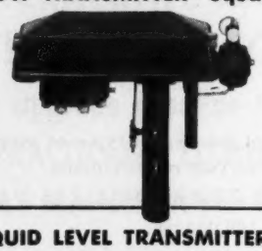
Available with differential ranges as low as 0—0.6" H_2O (ranges this low are exclusive with the Republic Transmitter) and as high as 0—750 psi. Range may be suppressed up to 80% of full scale for density or level measurements.

PRESSURE and ABSOLUTE PRESSURE TRANSMITTER



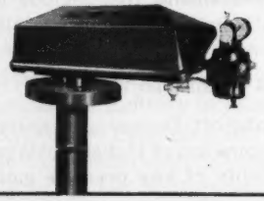
Pressure ranges from 0—1" H_2O to 0—2000 psi. May be easily adapted for absolute pressure ranges from 0—25 mm Hg to 0—100 psia.

FLOW TRANSMITTER—Square Root Extracting Type



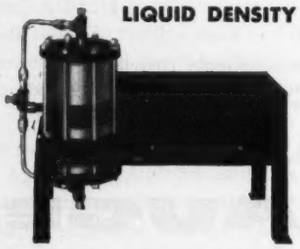
Automatically extracts square root function from flow measurements, permitting use of uniformly graduated charts and linear control devices. Available in all standard differential ranges.

LIQUID LEVEL TRANSMITTER—Bouyancy Type



Ranges to suit most applications. Can be used to measure level in closed tanks under pressure. Can also measure liquid-to-liquid interface.

LIQUID DENSITY TRANSMITTER—Bouyancy Type



Makes continuous density measurement of flowing liquids at line pressures to 300 psi. Fast response.

PNEUMATIC or PNEUMATIC-ELECTRIC TRANSMISSION

Special electrical meter body available for use with most Republic Pneumatic Transmitters. Permits locating pneumatic transmitter at metering point to cut piping costs and keep dangerous fluids out of control rooms.

for Measuring FLOW — PRESSURE — LEVEL — DENSITY

Republic Pneumatic Transmitters are as simple in operating principle as a laboratory weigh scale — and just as accurate! The only real difference is that forces instead of weights are balanced for a measurement.

This force-balance principle both permits and requires the use of strong, durable construction. That's why Republic Transmitters can be ruggedly built for low maintenance without sacrificing accuracy and sensitivity. Standard models are *guaranteed accurate* to ½% of full scale.

Range Flexibility — Changing ranges is merely a matter of shifting leverages in Republic Transmitters. Ranges may be changed as much as 2-1 on standard models, as much as 10-1 on double weighbeam models *with no change of parts.* Suppressed, reversed and compounded ranges are also readily available.

Corrosion Protection — Since process fluids are isolated to a small measuring chamber, special materials may be used for corrosion resistance. Minimum movement of fluid in chamber cuts maintenance when transmitter is used with dirty or viscous liquids.

These are but a few of the many features found in Republic force-balance Transmitters. Write for a free copy of Data Booklet with all of the details and complete description of various types.

*In a force-balance pneumatic transmitter, a force produced by the process variable is balanced against a pneumatic pressure. The amount of air pressure required to produce a balance is proportional to the process variable and may be conducted to remote reading instruments or used as the measuring impulse for an automatic controller.

REPUBLIC FLOW METERS CO. • 2240 Diversey Pkwy., Chicago 47, Illinois

When inquiring check CP 8107 opposite last page

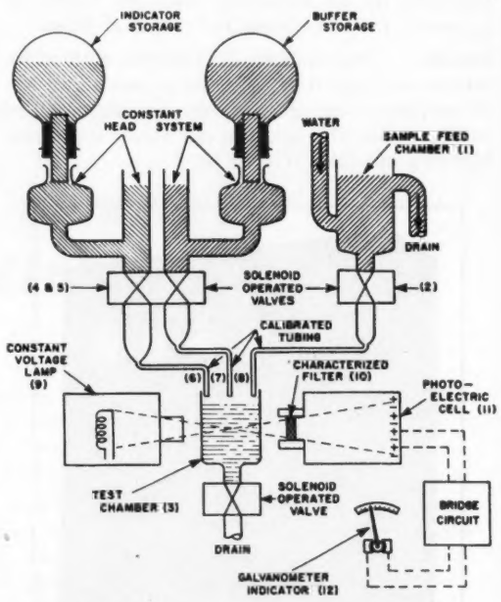
Performs titration, records water analyses

silica, hardness, phosphate, sugar, or chlorine can be found and recorded every few minutes

Uses: Automatic recording titrimeter will analyze for water hardness, silica, phosphate, sugar, or chlorine. It can be used for determining when to regenerate water softeners, controlling hardness in cleaning and dyeing operations, to check optimum chlorination, and in similar situations.

Features: While self-contained instrument has the appearance of a simple recorder, it contains all necessary equipment to make actual chemical titrations whose results are recorded.

Description: Equipment contained in the analyzer includes indicator, buffer, and sample feed systems. These three liquids are brought together



Sample is continuously fed to chamber (1). Sample valve (2) opens, filling test chamber (3). Reagent valves (4 & 5) open to add indicator and buffer solutions. Three calibrated capillary lines (6, 7, & 8) insure constant quantity. Light from source lamp (9) passes through sample in test chamber (3) and filter (10) to energize photo cell (11). Galvanometer (12) is calibrated directly in terms of measured variable

in a test cell. Here a photoelectric system makes color measurement which is reported on record chart in terms of measured variable.

In operation, controlled quantity of reagent, buffer, and water sample are mixed once every

three minutes. Quantities remain constant — water hardness (for example) is the only variable. Calcium and magnesium react quantitatively with indicator solution. After reaction is complete, solution contains a mixture of unreacted blue indicator and reacted red complex.

Colorimeter can measure concentration of the red complex only. Orange filter in photocell system prevents interference from blue indicator. Solution's light absorption makes it possible to measure water hardness directly in ppm of calcium carbonate.

Small synchronous motor drives program timer to control each cycle. Water is continuously fed to the sample feed chamber. Control of quantities is attained through solenoid valve and calibrated capillary tubing permitting constant delivery rate.

(Durometer is a product of Milton Roy Co., Dept. CP, 1301 E. Mermaid Lane, Philadelphia 18, Pa. Check CP 8108 opposite last page.)

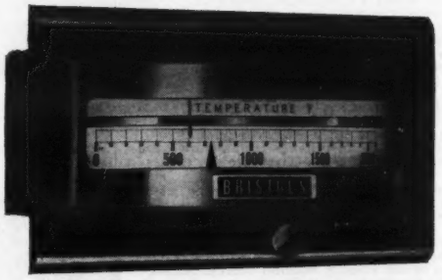
High torque millivoltmeter is self-compensating for thermo changes . . .

achieves 1% accuracy on pH, temperature

Uses: Millivoltmeter can be used as an indicator for thermocouples in pyrometers, tachometers, pH measurements or in power consumption measurements. It can be used with any primary sensing element supplying a millivolt signal.

Features: Instrument has short response time and accuracy of 1% of full scale.

Description: Millivoltmeter indicator is designed for short response time and high accuracy. High-torque jeweled millivoltmeter mechanism with Alnico V magnet has self-supporting coil. It



Special high-torque millivoltmeter mechanism is used

is equipped with neutralizing resistance to compensate for changes in coil resistance with ambient temperature changes.

(Mod 580 Indicating Millivoltmeter is a product of The Bristol Co., Dept. CP, Waterbury 20, Conn. Check CP 8109 opposite last page.)

NO Reducing Valve Needed

Here's real economy in temperature control.

Because Spence Temperature Regulators are designed to limit heater steam pressures to an adjustable maximum, the need for a separate reducing valve is completely eliminated.

The Spence Regulator takes steam directly from the boiler or high pressure line, reduces the pressure and regulates the flow as required to maintain a constant temperature output from the heater.

This means one relatively small combination pressure and temperature regulator replaces a reducing valve of the same size and a larger temperature regulator. Practically the entire cost of the large separate temperature regulator is saved. And, the total saving would also include the cost of a 3-valve by-pass along with all labor for installation.

This design feature is just one of the reasons for the thousands of Spence installations throughout American industry. *For details of other important design features, write for Bulletin T50.*



SPENCE
TYPE ET150
Temperature
Regulator

Spence

SPENCE ENGINEERING COMPANY, INC.
WALDEN, NEW YORK

When inquiring check CP 8110 opposite last page

A DOUBLE BARRELLED TROUBLE SHOOTER

PANALARM "50VS"

VISUAL SEQUENCE ANNUNCIATOR*

1 **VISUALLY INDICATES**
first "off-normal" and subsequent "off-normals".



2 **SEQUENTIALLY GROUPS**
related variables for easy interpretation.

Troubleshooting in complex processes can be expensive and time consuming. The Panalarm "50VS" Visual Sequence Annunciator *eliminates guesswork . . . pinpoints trouble.* It immediately flashes the cause of trouble; instantly shows resultant "off-normals", and provides a means of grouping and acknowledging related variables so that minimum interpretation is required . . . quick, direct corrective action can be immediately taken.

Your present Universal Panalarm "50" Annunciator System can be changed to provide visual sequence signals. This flexibility prevents obsolescence . . . has made the Panalarm "50" the most versatile audio-visual annunciator available today.

PANALARM "50VS" gives CONTROL INFORMATION

- The primary cause of trouble . . .
- Secondary "off-normals" resulting . . .
- Sequential follow-up of "off-normal" . . .

Send for Bulletin 6-A.
LISTED BY UNDERWRITERS' LABORATORIES

PANALARM
Alarm and Safety Division

PANELLIT, INC.
7409 N. Hamlin Avenue, Skokie, Illinois

*U.S. Patent No. 2701872 Copyright 1955, Panellit, Inc.

When inquiring check CP 8111 opposite last page

Instrument desiccant sealed in plastic capsules

Uses: Variety of desiccant and indicator units are tailored for use in drying, protecting, and showing condition of instruments and associated equipment.

Features: Desiccant capsules, indicating cards or plug-in devices complement each other in moisture control.

Description: Capsules are small, one-piece, transparent plastic dehydrators produced in three sizes. Both indicating and non-indicating types are available.

Indicating cards are impregnated with spots of moisture-sensitive material. Three standard types include two single spot cards and one three spot card. Each of these shows some selected degree of relative humidity.

External indicators show humidity conditions within sealed instrument or package. These are specially designed for military packaging (method II).

Dehydrating plugs control moisture inside equipment. They are designed for use during service, transit, storage. Color change of desiccant shows when plug is expended, replacement is necessary.

(Manufacturer is DriAire, Inc., Dept. CP, 132 S. Main St., S. Norwalk, Conn. . . . or for more information check CP 8112 on handy form opposite last page.)

Features radiation temp detector

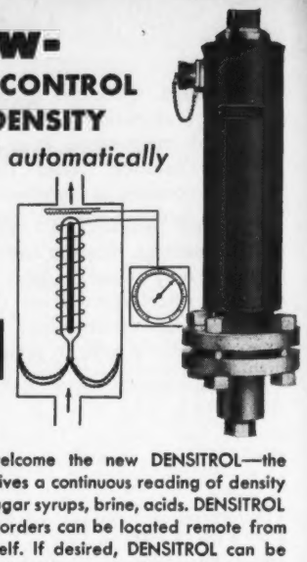
Outlining temperature measurement by radiation, two-page data sheet covers direct-sighting applications such as measuring temperatures of stationary or moving surfaces.

Data Sheet N-S3(1) is issued by Leeds & Northrup Company, Dept. CP, 4934 Stenton Ave., Philadelphia, Pa. When inquiring specify CP 8113 on handy form opposite last page.

now-
MEASURE, CONTROL LIQUID DENSITY
continuously and automatically with the

PRINCO
Since 1910

Densitrol



Process industries will welcome the new DENSITROL—the precision instrument that gives a continuous reading of density in flowing liquids such as sugar syrups, brine, acids. DENSITROL electrical indicators or recorders can be located remote from the sampling chamber itself. If desired, DENSITROL can be linked with control mechanisms for automatic regulation. For information on temperature and pressure ranges, calibrations, and other specifics, request Bulletin W-3.

PRECISION
THERMOMETER & INSTRUMENT CO.
1434 Brandywine Street, Philadelphia 30, Pa.

Makers of precision-built thermometers, barometers, hydrometers, gauges, indicators, mercury in glass thermo-regulators.

When inquiring check CP 8114 opposite last page

Instruments for Measuring AIR TEMPERATURE and VELOCITY

TEMPSCRIBE
Recording Thermometer



Available in 10 different ranges to cover −30°F to +160°F temperatures, and with spring-operated chart drives for any of the following chart rotations: 8 hours, 24 hours or 7 days.

This entirely self-contained, compact and reliable temperature recorder automatically writes a continuous record of temperature changes on a replaceable chart. Record shows at a glance maximum and minumum temperatures and the duration of temperatures above or below any given point; also shows the exact time of every temperature change and how rapidly it takes place. Recording pen and bi-metallic element are built in hinged, removable door which is also front of instrument. Thus, by merely changing doors it is easy to interchange temperature ranges. Instrument is 8" tall, 5½" wide and 4½" deep. Charts are 4½ inches in diameter.

Write for Bulletin I-715

FLORITE Anemometer



In principle, this unique instrument operates as an anemometer but provides instantaneous, direct readings of air velocity without timing, calculations or reference to charts. Readings are obtained by holding the instrument in the air stream so that air blows against its circular face, causing rotation of a multi-blade rotor mounted in instrument housing. The circular scale surrounding the rotor instantly turns to correct air velocity reading under an index pointer on scale window. Furnished with detachable handle (not shown) and leather case.

Available in two styles: One with a scale of 0-1000 ft./ min., and the other with a double scale of 0-3000 ft./min. and 0-35 miles per hour.

Write for Bulletin I-760

BACHARACH Industrial Instrument Co.
7301 PENN AVENUE • • PITTSBURGH 8, PA.

When inquiring check CP 8115 opposite last page

Calibrate this counter with pushbutton . . .

one output pulse is produced for every 1 to 2047 input pulses

Uses: Designed to operate with rotary flow sensing element which produces pulses at a rate proportional to fluid flow. Digitizer can also be used to scale or count pulses.

Features: Keyboard is provided which allows calibration of the counter to be changed by pushbutton.

Description: Computing electric counter converts digital outputs from rotary flow sensing element to gallons, pounds, or other desired units. Counter and its computing system have inherent accuracy of 0.5 of 1%. This makes it possible to measure total flow with an accuracy of ±½ percent over wide ranges and accuracies as high as ±1/10 percent at relatively constant flow rates.

Computing circuit consists of eleven magnetic binary dividers with an output pulse selection system. This enables user to obtain any number of counts from 1 to 2047 for 2048 input pulses from the sensing element. By depressing proper combination of buttons on keyboard it is possible to select appropriate conversion factor for any size flow sensing element.

Total flow is indicated on six-digit mechanical register on two decade-counting glow-transfer tubes. Single count may represent as little as 0.0001 gallon or more than a gallon.

Space and power requirements for the counter are very low — by using less than rated operating conditions for vacuum tubes, power consumption is held to under 40 watts. Power supply calls for 220 volt 60 cycle or 110 volt 400 cycle. Instrument measures 5¼" x 6½" deep and is designed for mounting in standard relay rack. Weight is 9½ lb.

(Model 25 Flow Digitizer is a development of Potter Aeronautical Co., Dept. CP, Route #22, Union, N. J. . . . or for more information check CP 8116 on handy form opposite last page.)

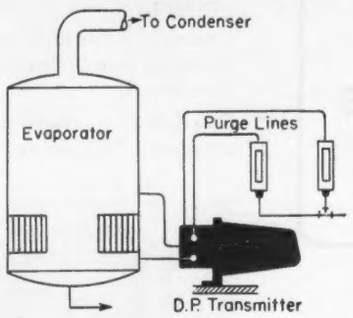
Describes recorder controller for humidity measurements

Highlight of two-page bulletin is schematic of method for controlling humidity in explosive or dusty atmospheres. Non-hazardous pneumatically-operated recorder controller is used. Other applications mentioned are material and air conditioning, elimination of static electricity.

AED 000-14 is issued by The Foxboro Company, Dept. CP, 174 Neponset Ave., Foxboro, Mass. Check CP 8117 opposite last page.

A SIMPLE ANSWER TO DIFFICULT PROBLEMS!

AUTOMATIC PURGING OF SUSPENDED SOLIDS



Problem: To obtain uninterrupted liquid level measurement and control where solids in suspension could settle out, plugging lead lines and causing errors in measurement.

Solution: Dual taps provide for complete flushing of the 333RD body as well as the lead lines.

Result: Consistently high accuracy. Flushing of manometer and lead lines cuts maintenance to a minimum. Evaporator efficiency is kept at a uniformly high level.

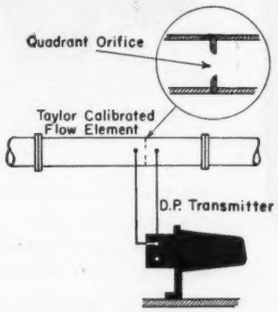
The Taylor TRANSAIRE* Differential Pressure Transmitter (333RD) is simple and economical, yet exceptionally adaptable!

IT'S inexpensive and easy to install—and to maintain. Changes in product or seasonal demand cause no problems, due to quick, simple range change feature. No seal pots—follows flows quickly because of low volumetric displacement. This pneumatic force-balance transmitter, designed to convert differential pressure into an equivalent 3 to 15 psi output, can be used to measure flow of liquid, steam or gas; liquid level or specific gravity. Pressure rating is 1500 psi, and it's available in any desired range from 20" to 800" of water.

Call your Taylor Field Engineer for details, or write for **Bulletin 98097.** Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

*Reg. U.S. Pat. Off.

HIGH ACCURACY WITH VARYING VISCOSITIES

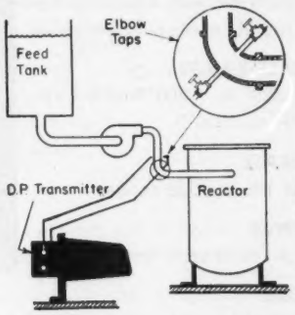


Problem: To get a high order of accuracy in measuring viscous fluids without special calibration curves and frequent changes in calibration due to troublesome variations in viscosity.

Solution: Its low volumetric displacement makes the 333RD transmitter ideally suited to capitalize on the improvements made possible by the recently developed European type quadrant orifice.

Result: Uninterrupted, accurate performance under difficult and variable viscosity conditions.

REVERSING FLOWS AND VARYING VISCOSITY



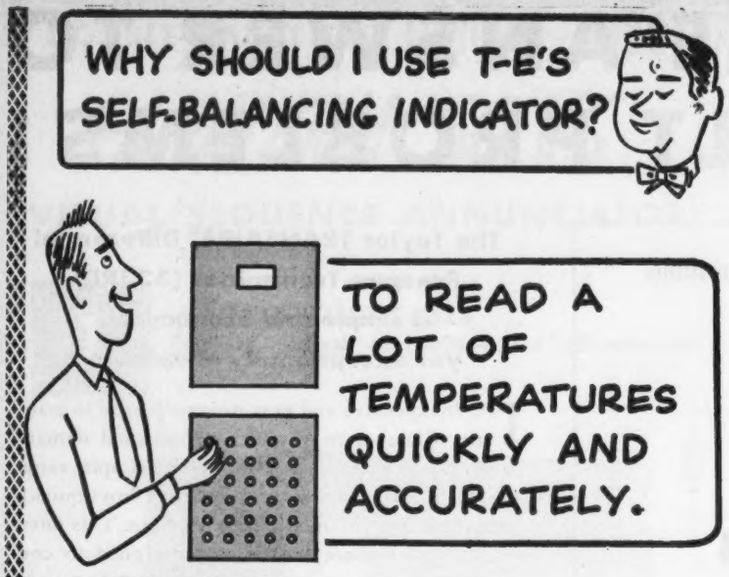
Problem: Flow control when there are changes in direction of flow and restrictions in the line are not desirable.

Solution: The use of the 333RD transmitter with Elbow Taps, as primary elements. Since there's a tendency to cavitation at the inside tap, the low volumetric displacement of the 333RD makes it particularly suitable.

Result: Accurate measurement, and consequently control, under very difficult conditions.

Taylor Instruments **MEAN ACCURACY FIRST**

When inquiring check CP 8118 opposite last page



LARGE CAPACITY
Several hundred thermocouples or resistance bulbs can be connected to T-E's indicator through toggle switches, rotary switches, or connector panels. Switches are housed in a separate case identical to the indicator case. Capacity is 50 to 160 points. For less than 50 points a smaller case can be used, for over 160 points, 2 or more cases can be supplied.

EASY-TO-READ
Large, 34" scale has from 400 to 600 widely spaced graduations for accurate and easy reading. Hairline is close to dial, minimizes errors from parallax.

SPEEDY
Full scale travel only 4 seconds. Balances rapidly at temperature value.



23 SCALE RANGES
From —320° to +200°F all the way up to 0° to 3000°F.

ACCURATE
±¼ of 1% of scale range.

SENSITIVE
1/20 of 1% of scale range.

DURABLE
Simple design keeps maintenance low and instrument life long. Only 2 moving parts, the motor and the shaft carrying dial, slidewire, and drive gear. Slidewire is enclosed to protect it from dust or electrical interference.

Interested? Write for bulletin 61-R.

Pyrometers • Thermocouples • Protection Tubes • Quick-Coupling Connectors
Thermocouple and Extension Wires • Resistance Bulbs • Connector Panels

Thermo Electric Co., Inc.
SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 8119 opposite last page

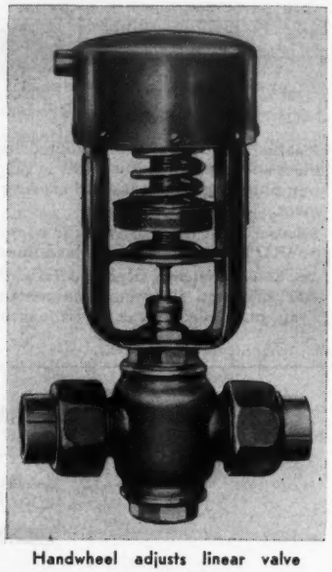
INSTRUMENTATION

Has linear valve movement for controlling fluids pneumatically

Uses: As final control element in pneumatic and hydraulic systems to maintain pressure, temperature or level in tank, vats, processes.

Features: Has linear movement operating either pneumatically or hydraulically.

Description: Valve has cadmium-plated steel spring and two-ply seamless metal bellows. Sizes available range from ¼ to 4" in a wide variety of models, including direct and reverse-acting.



Handwheel adjusts linear valve movement

Maximum rating of pressure assembly is 50 psi. Normal operating pressure is from 3 to 15 psi. Valve stroke starts at 3 psi and is completed at 15 psi. Frame is stainless steel, valve either bronze or stainless steel trim. Adjustment is by handwheel acting against spring. Models are single-seated, double-seated or three-way.

(No. 992-D valves are product of Fulton Sylphon Division, Robertshaw-Fulton Controls Company, Dept. CP, Box 400, Knoxville, Tennessee. Check CP 8120 opposite last page.)



AIR CONDITIONING CONTROL SYSTEM FOR PROCESSES—Temperature, humidity and air pressure in the modern smoke houses above are automatically held at the right point with unfailing accuracy by Powers automatic control.



Losses from shrinkage or inferior quality products are eliminated and uniform flavor, color and texture of product are insured by accuracy of Powers control. Your temperature control problem may be different, but like many others for which Powers has supplied the right control. Why not call our nearest office now or write us direct for Bulletin 370. (c13)

THE POWERS REGULATOR CO.
Skokie, Ill. • Offices in 60 Cities • See Your Phone Book

Over 60 Years of Automatic Temperature and Humidity Control

When inquiring check CP 8121 opposite last page

temperature conversion tables
FREE C to F and F to C



...stops guesswork on surface temps. The PANDUX gives linear thermal readings to ±2° full-scale accuracy. Unit sealed against corrosive atmospheres. Mirror dial protects element against external radiation. Easy to affix to surfaces with magnet or silicone grease. 2" in diameter; weighs 1 oz. Fully guaranteed. Specify model wanted.

Order today

For checking: ■ Pipes and ducts ■ Dies and molds ■ Freezers, ovens, boilers ■ Ceilings, walls and floors ■ Motors and cylinder blocks ■ Bearings and journals ■ And hundreds of other vital uses

ONLY **$6.75** Complete with magnet clamp and 1/2 oz. of silicone grease.

Model 309F: —50°F to 250°F
Model 309C: —50°C to 110°C
Model 310F: 0°F to 300°F
Model 310C: —10°C to 150°C
Model 311F: 70°F to 370°F
Model 311C: 20°C to 180°C
*Model 314: 50° to 750°F
*Without Silicone Grease

For FREE Temperature Conversion Chart No. CP-75

PACIFIC TRANSDUCER CORP.
11836 W. Pico Blvd. — Los Angeles 64, California

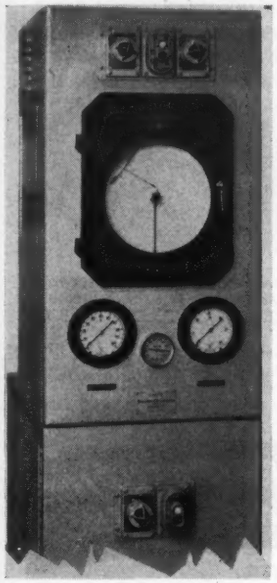
When inquiring check CP 8122 opposite last page

Records vapor pressure to 0.1 psi, shows changes in three minutes blending butane, gasoline

Uses: Automatic blending of motor gasolines for economical ratio of butane to base stock.

Features: Automatically records vapor pressure to 0.1 psi and reflects any change in vapor pressure within three minutes.

Description: Blended gasoline is pumped at constant rate to bath maintained at test temperature. Preheater in bath brings sample to test temperature before reaching constant-liquid-level float chamber. Vapor pressure in float chamber is measured. Vapor chamber is fitted with calibrated capillary which continuously bleeds all entrained air for more accurate vapor-pressure reading. Instrument will record to 0.1 psi vapor pressure with mean deviation of 0.11 psi Reid. Sampling system is fully enclosed to capture full volatility of "blend" sample.



Recorder monitors blending of motor gasolines by vapor pressure

Instrument is designed for batch or in-line blending to ASTM specifications on 24-hr operation. Daily service and checking can be performed without interrupting service.

Equipment uses 115v AC, single-phase, 800 watts, and is 20 x 34 x 66". One model has range of 7-15 psi RVP. Second model has range of 6-20 psi RVP.

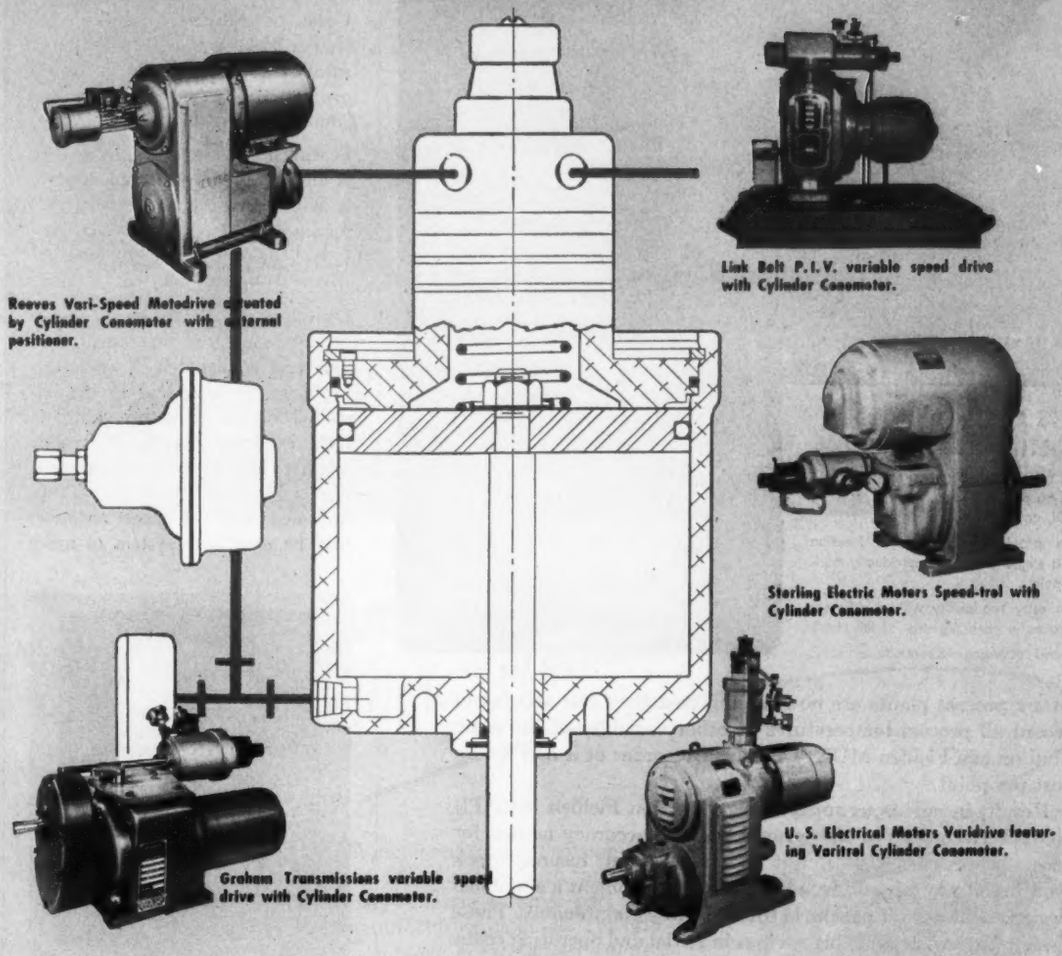
(Automatic Reid vapor-pressure recorder is product of Precision Scientific Company, Dept. CP, 3737 W. Cortland St., Chicago 37, Ill. . . . or for more information check CP 8123 opposite last page.)

Describes miniature rectifier weighing 0.1 ounce

Illustrating silicon rectifiers, four-page two-color booklet includes conventional transformer-rectifier circuit data chart.

Bul SR-18 is issued by Bogue Electric Mfg. Co., Dept. CP, 52 Iowa Avenue, Paterson 3, N. J. Specify CP 8124 opposite last page.

LOW COST, EFFICIENT Automatic Speed Control NOW AVAILABLE with the CYLINDER CONOMOTOR



For many years, industry's requirements for a practical method of controlling speed in operations involving such variables as flow, temperature, pressure, liquid level, tension, etc., could not be adequately satisfied. Now, the Cylinder Conomotor—a pneumatically positioned power operator used as original equipment on virtually all major variable speed drive units—affords low cost, dependable automatic speed control for processes . . . roll-winding equipment . . . heat exchangers . . . machine tools . . . material conveyors.

Engineers are becoming more and more conscious of the possibilities offered by automatic control of variable speed drives through pneumatic means. Pneumatic speed control combines all the advantages of simplicity, versatility and sensitivity at a low, low cost. An additional inherent feature of pneumatic control is its explosion-proof characteristic—a specified must in many industries today.

Conoflow engineers, seasoned in control techniques, can help you adapt the Cylinder Conomotor to your speed changing requirements . . . Call in Conoflow today, you'll like our personalized service.

FOR ADDITIONAL INFORMATION ON CONOFLOW CYLINDER OPERATORS WRITE FOR BULLETIN B-50-2

CC-502

Conoflow Controls®

CONOFLOW CORPORATION

FOREMOST MANUFACTURERS OF FINAL CONTROL ELEMENTS

2100 ARCH STREET, PHILADELPHIA 3, PA.

When inquiring check CP 8125 opposite last page

All Process Temperatures Now Recorded on One Chart at Low Cost



FACTS ABOUT THE FIELDEN MULTI-POINT RECORDER

- Records on one chart as many as 6, 24, 48 or even 96 points of temperature, pressure, level, pH, conductivity, speed, etc.
- Can be provided with control function having a single point or individually controlled points.
- Provides easy readability with 6 different color traces in each segment of the chart.
- High-speed recording—5 seconds per point.

Many process plants are now finding that they can accurately record all process temperatures or other variables of the same kind on one Fielden MULTI-POINT Recorder at a new low in cost per point.

Results in numerous applications show that Fielden MULTI-POINT Recorder not only provides all the accuracy needed for most processes (±0.5%), but its high speed insures quick warning of any upsets. In addition, the instrument's simplified design enables plant personnel to handle any maintenance. These design features provide big savings in initial and operating costs.

Send the coupon today, and learn how *Fielden Simplified Instrumentation* can solve your problems too . . . dependably *and* economically.

Robertshaw-Fulton CONTROLS COMPANY

FIELDEN INSTRUMENT DIVISION
Dept. G. 2920 N. 4th St., Philadelphia 33, Pa.

Please send me bulletins describing:

☐ FIELDEN MULTI-POINT Recorder-Controller
☐ TEKTOLOG Recorder-Controller
☐ TEKTOR Level Limit Control
☐ NULL-BALANCE Recorder-Controller
☐ TELSTOR Continuous Level Indicator

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____

When inquiring check CP 8126 opposite last page

Measures smoke density in Ringelmann numbers and gives alarm

Uses: Measures smoke discharge to keep it within limits of smoke control and air pollution ordinances. System provides continuous monitoring of combustion.

Features: Stack smoke density is measured and indicated directly in both percent smoke and Ringelmann number. Alarm relay provides for operation of external alarm at preset value of density.

Description: System consists of light source, photo-electric scanner, and smoke density indicator. Light source and scanner are installed on stack or breeching so light is aimed directly at lens of scanner. Density of smoke obscuring light beam is measured and indicated. One of three recorders may be used with system to make



Indicator shows both percent smoke and Ringlemann number

continuous recordings of smoke conditions over 24-hr period. One recorder is a single-pen unit and records periods of excess smoke on 12" chart. Second recorder has 8" chart and shows both time and duration of excess smoke over preset value. Third recorder provides 8" chart records of time and duration from two or more indicators.

(Fireye system FE-3 is product of Combustion Control Division, Electronics Corporation of America, Dept. CP, 718 Beacon St., Boston 15, Mass. Check CP 8127 opposite last page.)

IS THIS YOUR CONTROL PROBLEM?

1. How to indicate a change in resistance through a filter due to a clogging of the filter?
2. How to indicate a change in differential across an orifice due to a change in air flow conditions?
3. How to indicate an unbalanced condition of two air ducts?

MERCOID HAS THE SOLUTION

A Diaphragm Differential Pressure Control which operates from minute changes (03 of water) in the difference between two pressures.

Ranges to cover most applications—(inches of water) 6" vac. to 6" press., and 30" vac. to 30" pressure.

MERCURY SWITCH EQUIPPED



DIFFERENTIAL PRESSURE CONTROL — EXPLOSION-PROOF HOUSING — AVAILABLE IN WEATHERPROOF HOUSING

WRITE FOR BULLETIN

THE MERCOID CORPORATION
4201 BELMONT AVE., CHICAGO 41, ILL.

NEW YORK 17, N. Y. 205 E. 42nd Street
PHILADELPHIA 32, PA. 3137 N. Broad Street

When inquiring check CP 8128 opposite last page

"LIQUIDS WORTH STORING ARE WORTH MEASURING"

with a

LIQUIDOMETER

Tank Gauge

- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES



WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 8129 opposite last page

Process and oven temperatures from 70° to 300°F controlled by bulb thermostat . . .

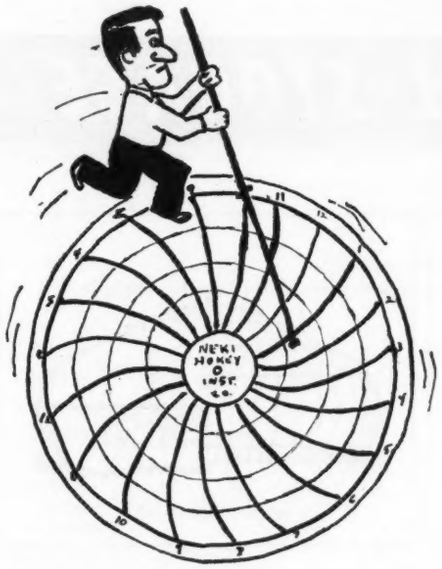
unit handles electric loads up to 15 amp with automatic snap-action

Uses: Local temperature control.

Features: Handles electric loads up to 15 amp at 125/250/460v AC.

Description: Bellows in liquid-filled sensing bulb actuate contacts through push-rod. Temperature ranges are 70 to 300°F or −50 to 200°F. Contacts are SPST, either NC or NO. Screw adjusts response within temperature ranges. Unit has flange or pipe-thread mount. Bulb is 5/8" diameter, 2 21/32" long over-all. Including switch, unit is 4 13/16" long over-all.

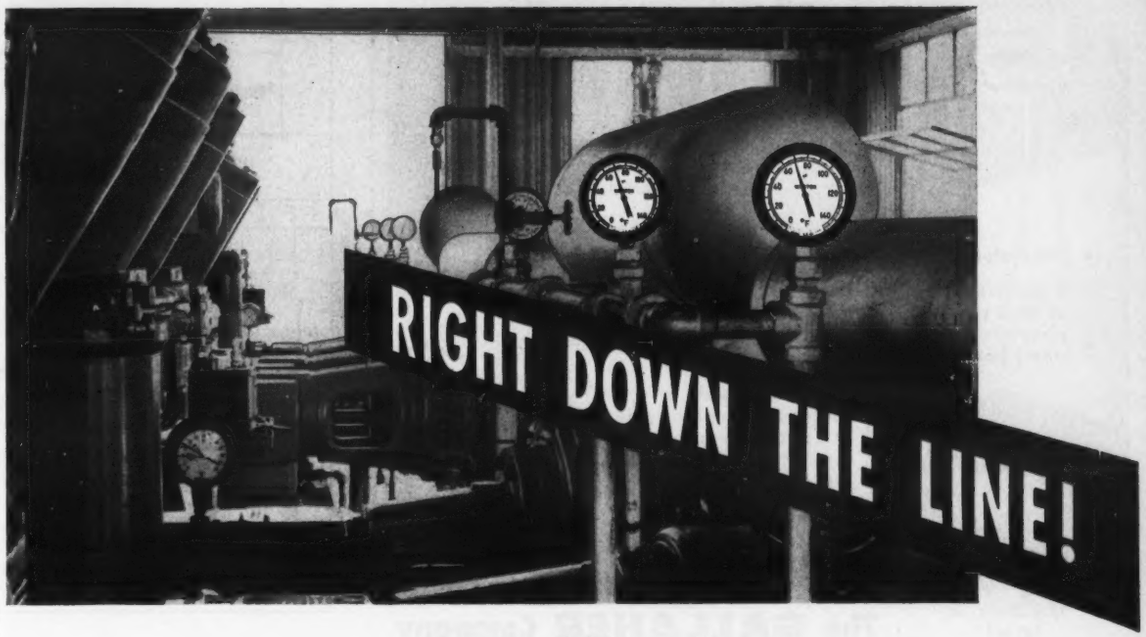
(Series 20000 bulb thermostat is product of Fenwal, Inc., Dept. CP, 243 Pleasant St., Ashland, Mass. . . . or check CP 8130 opposite last page.)



Is process control a treadmill?

If you've been looking for new ideas for process control and instrumentation, you'll want to be sure to see CHEMICAL PROCESSING's Featured Instrument Section in September. CP editors plan to bring you a rundown on all developments of the past year in instrumentation, handy data, actual case histories. Watch for it in September CHEMICAL PROCESSING.

DEPENDABILITY



Weston thermometers with Multiple bimetal helix*

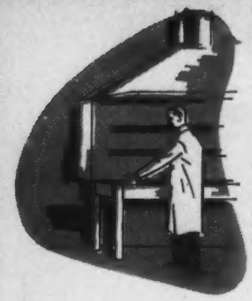
The reasons why WESTON all-metal industrial thermometers excel in dependability and long life . . . enjoy such outstanding preference throughout industry . . . stem in large part from Weston's exclusive design and manufacturing methods. The critical *sensing elements* are all Weston-made in the shorter *multiple helix* form to insure rugged, *nonsagging* units. They are then *cycle-seasoned,* over broad temperature ranges, to insure *consistently precise indications* over far longer periods. Thus they serve better, longer, at far lower over-all costs. Bulletin containing sizes, ranges and prices, available on request. WESTON Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J.



WESTON
Thermometers

AVAILABLE THROUGH LEADING DISTRIBUTORS

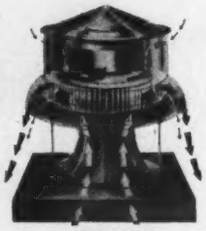
When inquiring check CP 8131 opposite last page



Safely Ventilate
MOISTURE and FUMES

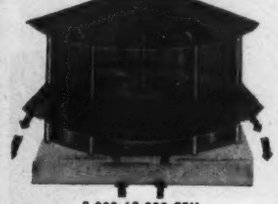
Three outstanding features make Air-Van (R) Power Exhausters especially suited to situations where moisture and fumes are present.

- **The motor is out of the air stream.**
- **A positive air seal-off creates a constant curtain of fresh clean air around the motor shaft. This absolutely prevents fumes from entering the motor housing.**



Direct Drive
150-11,000 CFM.
S.P. to 4.2"

Patented scroll effect design assures positive air removal. Research has shown that without scroll effect, efficiency beyond ¼" S.P. is impossible.



5,000-65,000 CFM.
S.P. to 4".

Other Gallaher features include low silhouette, weather-proof design, low noise levels, and availability in special metals and finishes.

Patents
2188741—2526290
Patents pending

The GALLAHER Company

Pioneers in Research-Designed Power Roof Exhausters

4108 Dodge St. Omaha, Nebraska

When inquiring check CP 8132 opposite last page

for hard—tough—dense concrete repairs..



Non-Shrink EMBECO PRE-MIXED MORTAR

Outlasts and outwears plain cement-sand patches because...

- *Does not shrink* upon hardening.
- Bonds tightly to old concrete and mortar.
- Tough iron particles serve as reinforcement.
- Density resists water and oil penetration.
- Higher compressive and impact-resistant strength.
- Hard—contains no asphalt.

send for folder



EMBECO PRE-MIXED MORTAR IS READY TO USE—you add only water.

Used to patch cracks, disintegrated and worn concrete floors, walks, steps, walls, etc.

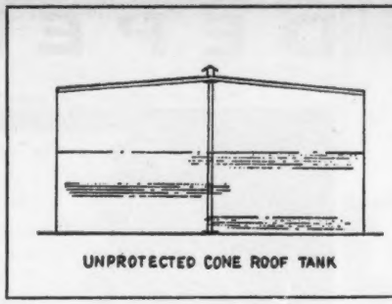
Write for 4 page folder illustrating many applications.

Creators and Manufacturers of Products to Improve Concrete and Mortar

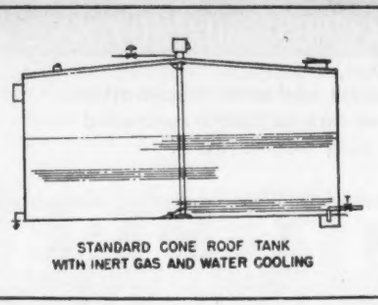
THE MASTER BUILDERS CO.

CLEVELAND 3, OHIO — Subsidiary of American Marietta Company — TORONTO 15, ONTARIO

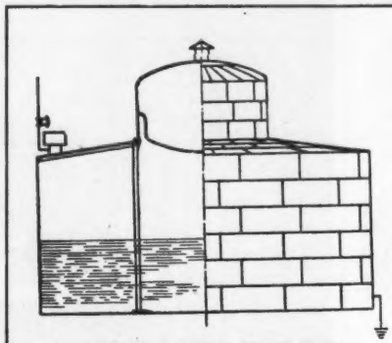
When inquiring check CP 8133 opposite last page



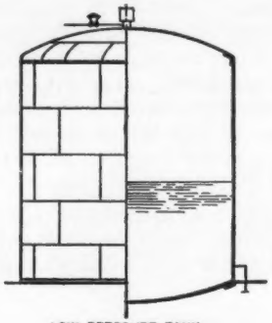
UNPROTECTED CONE ROOF TANK



STANDARD CONE ROOF TANK
WITH INERT GAS AND WATER COOLING

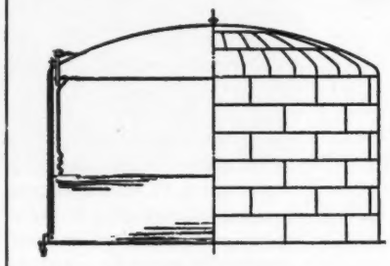


VARIABLE VAPOR SPACE TANK

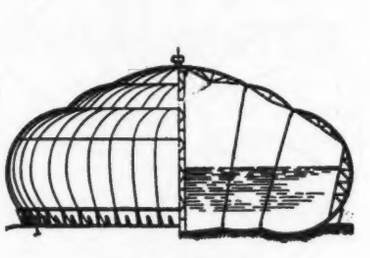


LOW PRESSURE TANK

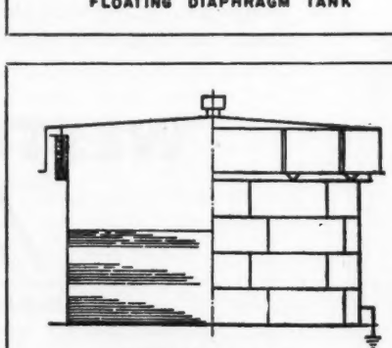
ALCOHOL STORAGE—



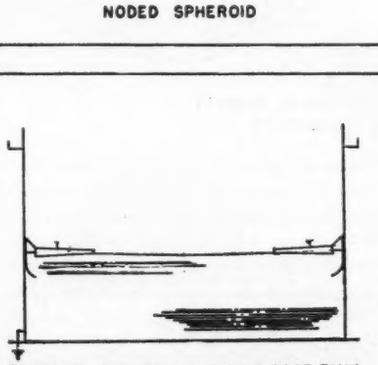
FLOATING DIAPHRAGM TANK



NODED SPHEROID



LIFTER ROOF TANK



ANNULAR PONTOON FLOATING ROOF TANK

Design of storage tanks is an important factor in providing fire protection in installations storing large quantities of alcohol

A method of rating alcohol storage tanks has been developed by James Duggan, Superintendent of Carbide and Carbon Chemical Company's Process Safety Developments at South Charleston, W. Va. This rating method takes into account five basic factors:

1) *Explosion hazard*
2) *Fire hazard from venting of vapors*
3) *Susceptibility to damage from fire exposure*
4) *Dependence on fire fighting efficiency*
5) *Dependence for safety on mechanical appurtenances*

By conceiving an ideal tank and giving each of these factors a rating of 20 points, a fire safety rating of 100 is set up as an arbitrary standard. This ideal tank would be a pressure vessel designed to eliminate all venting thus containing completely the flammable compound. It would have no dependence on mechanical devices and would be protected completely from exposure to fire. Such an ideal tank is impractical, of course, but it provides a good measuring stick for tank safety.

The table below gives the ratings which have been assigned eight different type tanks using the standard.

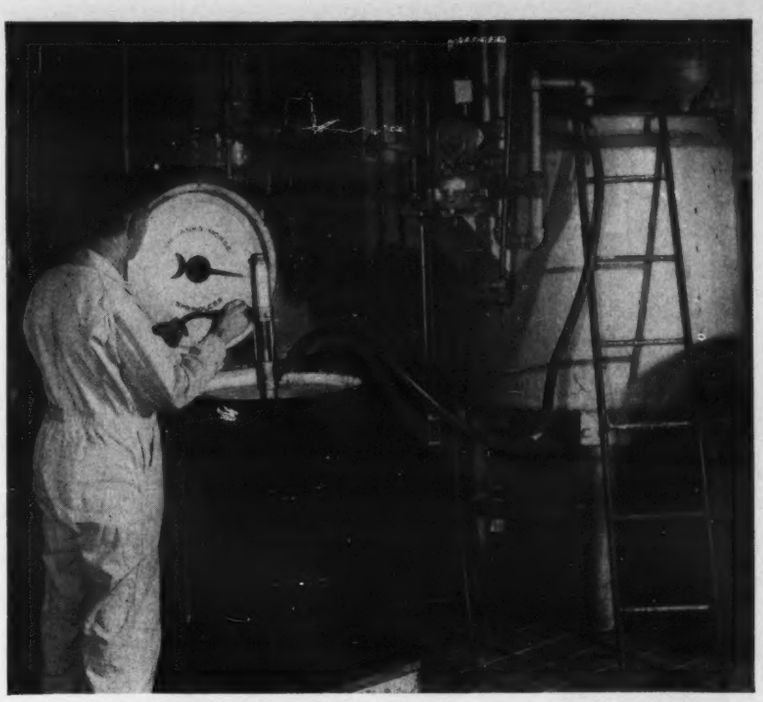
are you sitting on a powder keg?

Fire Safety Ratings
Conservation Type Tanks Versus the Standard Cone Roof Tank

Rating Factor	Ideal Tank	Unprotected Cone Roof	Standard Cone Roof	Cone Roof Inert Gas & Water Cooling	Variable Vapor Space with Inert Gas	Low Pressure (2-½ lb.) with Inert gas	Floating Diaphragm	Floating Roof	Floating Roof, Weather-Shield
Explosion hazard	20	0	5	20	20	20	15	20	15
Fire hazard from venting of vapors	20	0	5	10	10	15	20	15	15
Susceptibility to damage from fire exposure	20	0	5	15	10	15	10	20	15
Dependence on fire fighting efficiency	20	0	5	10	10	10	10	20	15
Dependence for safety on mechanical appurtenance	20	20	15	5	10	10	20	10	10
FIRE SAFETY RATING	100	20	35	60	60	70	75	85	70

In comparing the various tank designs with an ideal tank, each is penalized to the extent of the apparent existing hazard. For example, an unprotected cone roof tank with inadequate vent devices, no flame arrestor, and inadequate spacing, is given a fire safety rating of only 20. It is dependent for fire safety on its mechanical structure. All other factors have been violated. This is the lowest rating given any type of tank.

(*Continued on page* 127)



Oils go "direct-from-drum" to mixing kettle at Johnson's Wax

At the modern S. C. Johnson & Son, Inc., plant in Racine, Wisconsin, an air-operated Graco Fast-Flo drum pump, mounted directly into bung opening of the original drum, transfers oil to the mixing kettle.

Since the mixing of ingredients for wax products must be closely controlled, the quick "start and stop" of the Fast-Flo pump fits the process perfectly.

Johnson's Wax uses Fast-Flo pumps regularly to transfer oils, solvents, etc., received in drums. Drums stand upright, in safe handling position, with leakage or spillage minimized.

If your company receives fluids in original drums, there's a good chance the Fast-Flo pump can simplify an operation and save time and dollars. Use it for transfer, dispensing, applying, mixing or spraying. This economical "direct-from-drum" pump is light in weight, and it screws or clamps easily into working position.

We invite you to get an idea for your own plant from the 24-page Graco Fast-Flo application booklet. Full of dollar-saving ideas! Write for your copy today.



This Fast-Flo idea book shows how the pump is being used in a variety of industries. Write for your copy.

• Graco products are sold and serviced through authorized distributors in all principal U. S. and Canadian trading areas and in 63 foreign countries. Your nearby Graco distributor can give you helpful personalized service. Call him.

GRACO *air-powered* **"DIRECT-FROM-DRUM" PUMPS**

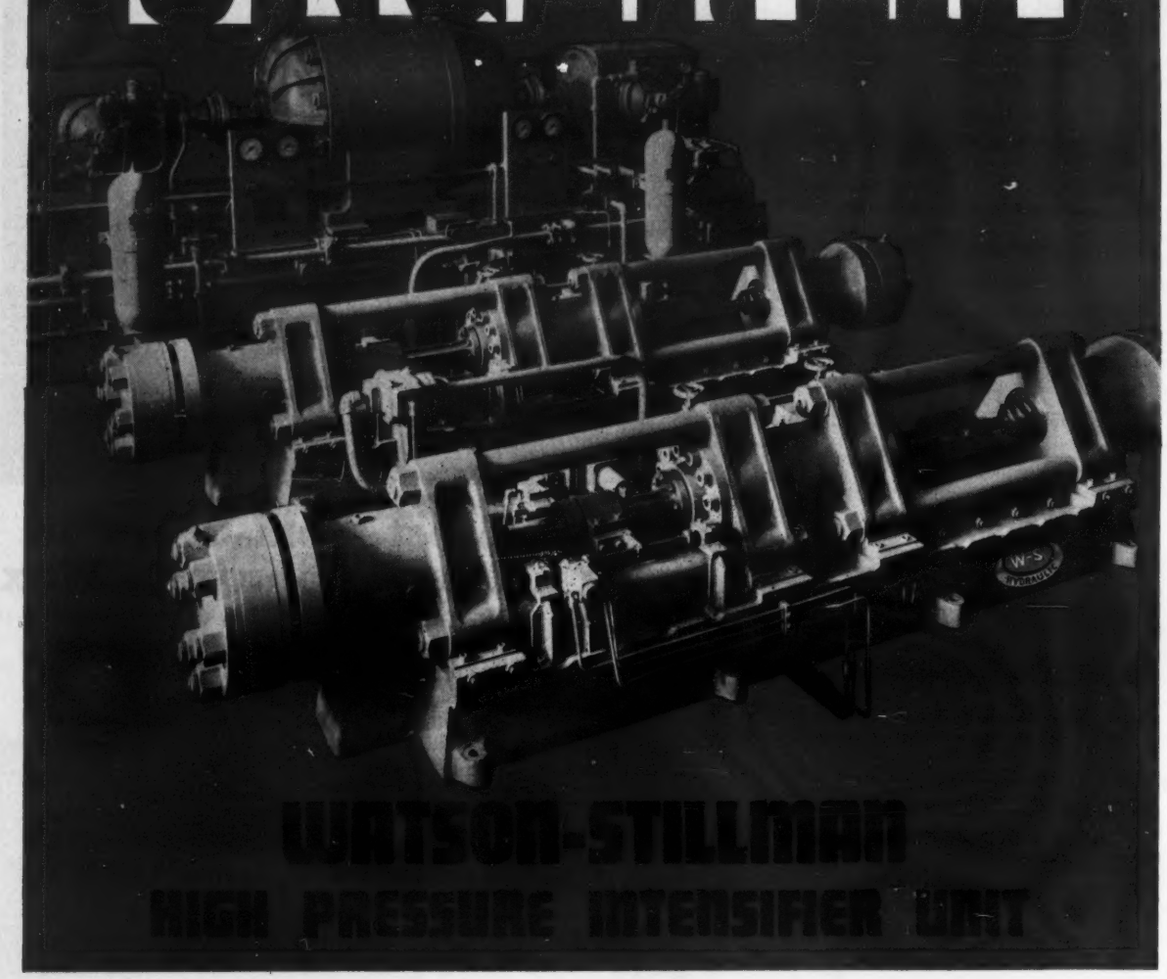
GRAY COMPANY, INC. 72 GRACO SQUARE, MINNEAPOLIS 13, MINN.

FACTORY BRANCHES: NEW YORK • PHILADELPHIA • DETROIT • CHICAGO • ATLANTA • SAN FRANCISCO

GRACO... | Engineers and Manufacturers of air-powered paint circulating systems and heavy material pumps, drum pumps, lubricating and automotive service equipment

When inquiring check CP 8134 opposite last page

LONGER LIFE



For longer life, a high capacity, *low speed* Watson-Stillman intensifier unit offers you a sound approach to the solution of the problems of packing and fatigue at pressures up to 100,000 p.s.i. Because of its slower piston speed, and resultant low rubbing velocity, packings last longer. Slower cycling speed reduces the number of stress reversals, increases fatigue life in high pressure cylinder and valve block. At this low speed of operation, you can expect 10 to 12 times the life of comparable high speed equipment.

High pressure intensifier units are only one of the Watson-Stillman "Completeline" of hydraulic machines and equipment. It will pay you to get in touch with W-S first, when it comes to vertical and horizontal pumps and accumulators, too. All W-S equipment is economical—both in first cost and operating cost.

THKP THE WATSON-STILLMAN COMPANY DIVISION OF H. K. PORTER COMPANY, INC. 100 Altman Rd., Roselle, New Jersey

W-S HYDRAULIC

When inquiring check CP 8135 opposite last page



Coupling for pipelines has neoprene packing ring (arrows). It allows full pressure use of pipelines while waiting for area to be weld safe

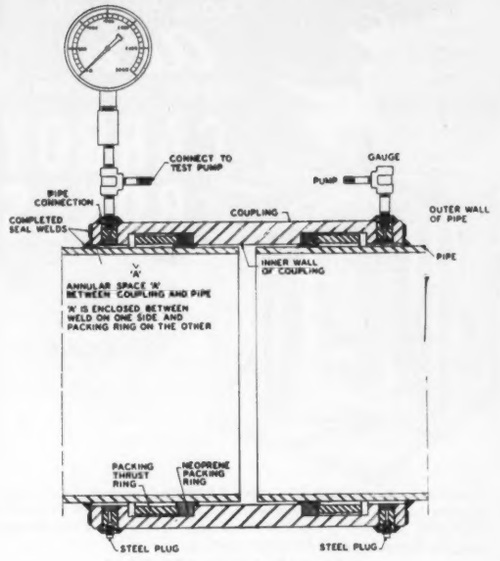
Permits welding of pipeline while pumping through it

coupling allows full pressure to be applied while rejoining pipelines

When oil or gasoline pipelines are cut for repairs or alterations or to put in T-sections, some of the oil or gasoline invariably spills in. Welding of these pipelines is usually delayed until the area is sufficiently cleaned up.

This delay can be eliminated by use of a special coupling. A sleeve slides over the two pipe ends and neoprene packing rings seal space between pipe and sleeve. Longitudinal bolts in the ends of the couplings bear against the steel rings which in turn exerts pressure on the neoprene packing and forces it against the pipe wall. This will carry full line pressure and permit safe welding after the spilled product has had enough time to be cleared up.

Neoprene was chosen as the packing material because it resists deterioration by crude oil and gasoline, has high sheer and tensile strength, and good resistance to heat from welding operation. Couplings are designed to withstand the working pressure of 1200 psi for welding. Usual time required for installing the couplings runs about 30



Longitudinal view of coupling

minutes. Couplings can be supplied in sizes from 2 to 36 inches. Sizes from 2 to 10 inches are machined from seamless steel tubing. Larger sizes are made from mild carbon steel plate which is roll welded and X-rayed.

(Weld + Ends are a product of the Pipe Line Development Co., Dept. CP, 5700 Detroit Ave., Cleveland 2, Ohio . . . or for more information check CP 8136 on handy form opposite last page.)

Windows for radiation shielding are ready to install . . .

glass with densities of 2.7, 3.3, and 6.2 are used in shielding windows

Completely assembled radiation-shielding windows consisting of individual castings of radiation-resistant glass up to 10" thick stacked together in a framework are now available for test cell walls.

Used to protect research personnel by reducing radiation intensity to a tolerable level, windows permit direct observation of work carried out remotely in 'hot" areas. Package units are available in either wet or dry assemblies.

Glass with densities of 2.7, 3.3, and 6.2 is used in the windows. Glass is stabilized to prevent darkening effect of X-ray and gamma-ray exposure. Light transmittance through glass is good. Total internal transmittance in six-inch piece is 80% for the 2.7 density glass, 86% for the 3.3 glass, 58% for 6.2 glass.

(Windows are a product of Corning Glass Works, Dept. CP, Corning, N.Y. . . . or for more information check CP 8137 opposite last page.)



All industry will be interested in this announcement that Marman Products Company, Inc., Los Angeles, is now a wholly owned subsidiary of Aeroquip Corporation, Jackson, Michigan.

Marman is known as the outstanding producer of band clamps, V-band couplings, channel band couplings, stainless steel straps, flexible fuel line couplings, and the new LIVE joint system. Aeroquip is the world's leading producer of flexible hose lines with detachable, reusable fittings for industrial and aircraft applications, and a major supplier of self-sealing couplings.

On many leading makes of industrial equipment, Marman products and Aeroquip products work side by side as important components. Manufacturers as well as users gain timesaving and moneysaving advantages.

As a subsidiary of Aeroquip, Marman is in excellent position to expand its industrial sales, service, and engineering facilities. Please write for complete information.

MARMAN PRODUCTS COMPANY, INC.

A SUBSIDIARY OF Aeroquip CORPORATION

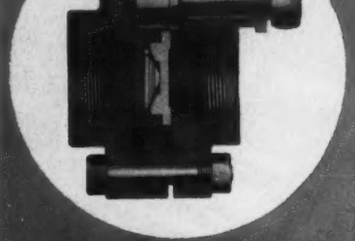
11214 EXPOSITION BLVD., LOS ANGELES, CALIFORNIA

MARMAN PRODUCTS ARE MANUFACTURED UNDER VARIOUS U.S. AND FOREIGN PATENTS AND OTHER PATENTS PENDING

When inquiring check CP 8138 opposite last page

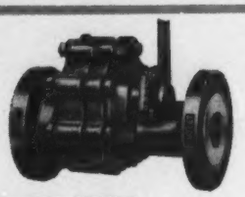
Everlasting Valves

are superior for many services





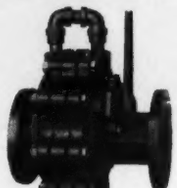
BOILER BLOW-OFF
Quick acting, also handwheel operated "Y" and angle types. For pressures up to 600 psi.



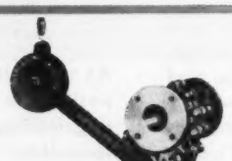
GENERAL SERVICE
Where drop-tight seal and full flow is essential.



CYLINDER OPERATED
Can be remotely controlled, electrically or manually.



STEAM JACKETED
Assures free flow of viscous materials.



WEIGHT-OPERATED
For automatic drains or emergency shut off.

When you want

- quick action
- drop-tight seal
- minimum pressure drop
- straight-through full flow
- self-grinding rotating disc
- valves that cannot wedge or jam

then you want an Everlasting Valve

No other valve has all the Everlasting features . . . proven by half a century of service to assure dependable, leak-tight service.

LET US HELP YOU WITH YOUR VALVE PROBLEMS

EVERLASTING Valves

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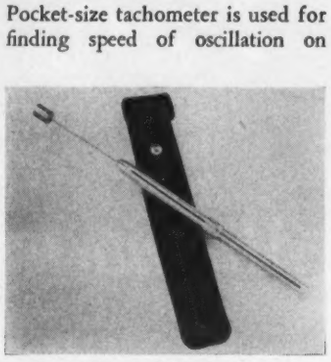
EV392

When inquiring check CP 8139 opposite last page

SAFETY

Checks vibration rates of 200 to 2000 cpm

Pocket-size tachometer is used for finding speed of oscillation on vibrating screens, conveyors, separators, and other equipment.



Pocket-size tachometer for 200 to 2000 cpm

Instrument has range of 200 to 2000 cycles per minute. It comes equipped with a leather carrying case.

(Vibra-Taks are a product of the Martin Engineering Co., Dept. CP, Neponset, Ill. . . . or for more information check CP 8140 on handy form opposite last page.)

Counteracts eye burns from alkalis or acids

Uses: Liquid eye wash is used to counteract burns from either acids or alkalis.

Features: Because it is neutral in action, safety eye wash can be employed in high concentrations to assure rapid and penetrating neutralization.

Description: Material has a pH of 7. Owing to its buffering action, the hydrogen ion concentration always remains in physiologic range. To use, it is only necessary to pour the liquid over the eye or skin from its polyethylene container. It is available in 4 and 32 ounce bottles.

(Neutralize is a product of E. D. Bullard Co., Dept. CP, 275 Eighth St., San Francisco, Calif. . . . or check CP 8141 opposite last page.)

HERCULES
CORK CUSHIONED
aero
RUBBER CUSHIONED
CARBOY BOXES

5 GALLONS

13 GALLONS



Treen manufactured 5-6½- and 13 gallon carboy boxes are quality built in accordance with ICC regulations, with features that give all-point protection; reducing hazards and breakage, ease in handling and compact loading.

WRITE FOR COMPLETE DATA

TREEN BOX COMPANY
TIOGA AND MEMPHIS STS., PHILADELPHIA 34

"Aces in Cases" for over 50 years

When inquiring check CP 8142 opposite last page

SINGLE COST, DOUBLE RETURN:

–One Company's Experience with Solvent Recovery

A decal firm faced shut-down by the board of health unless lacquer fumes in work areas were cleaned up. Barnebey-Cheney engineered a recovery system that eliminated the health hazard and also returned valuable solvents for re-use.

The result: Production jumped 45% overnight, and virtually all of the solvents are recovered. Let us demonstrate how we can solve your air recovery problems and also save solvents. Write or call — no obligation.

BARNEBEY-CHENEY Company
CASSADY AT EIGHTH COLUMBUS 19, OHIO

In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

When inquiring check CP 8143 opposite last page

(*Continued from page* 123)

The highest fire safety rating is given the floating roof tank due to the fact that the large majority of the hazards involving bulk storage have been eliminated. It is penalized five points for the hazard of venting of vapors which may escape around the seal and ten points for increased maintenance and its dependence on maintaining a tight seal.

Floating diaphragm tank rates high as it eliminates practically all vapor losses and is reasonably independent of mechanical appurtenances for safety. It is penalized five points for the potential hazard of vapor leakage past the diaphragm which might cause an explosive mixture in the vapor space. Ten points are deducted because of the susceptibility of the diaphragm to damage, and because fire fighting efficiency must be reasonably high to insure protection under fire exposure conditions.

The low pressure tank equipped with inert gas protection is penalized only five points for the hazard of venting. It is less susceptible to damage from fire exposure than the floating diaphragm tank but is more dependent on mechanical appurtenance. The variable vapor space tank with inert gas protection, and the water cooled inerted standard cone roof tank rate lower than the low pressure tank because the fire hazard of venting vapors is greater. Variable vapor space tank is considered more susceptible to damage by fire exposure but less dependent on mechanical appurtenances than the standard cone roof tank with inert gas protection. There are no bargains in safety and providing the very best form of storage will necessitate a larger outlay of capital than it would merely to store this material in cone tanks.

However, a fire-safe tank will conserve product by decreasing vaporization, the gross savings of which can be applied to amortize the increased cost and defray the increased depreciation and maintenance. In a study conducted by UCC based on 60′ x 40′ ethyl alcohol tank averaging half full and turnover twelve tank volumes per year ethyl alcohol (priced at $0.56 per gallon) ethyl alcohol vapor recovery amounted to an annual gross savings of $3,050 in the floating diaphragm tank, $3,000 in the low pressure tank with inert gas and $2,560 in the floating roof tank.

Information for this article came from a paper delivered by Mr. J. J. Duggan of UCC which was presented at the 57th Annual Meeting of the NFPA. This later appeared as an extended article in the quarterly of the NFPA.

Have a safety problem . . .?

the handy Product Directory (pages 185 to 188 in this issue) is your guide to equipment and ideas.

Be Wise—Economize—Standardize—Simplify Stock Problems—with the AO† R5000 RESPIRATOR*

Here's *complete* respiratory protection in one "package"! If you have several respiratory hazards to control, the AO R5000 will save you inventory problems and money. This ingenious twin cartridge respirator converts to many types of protection quickly merely by interchanging the filters and cartridges. Ask your nearest AO Safety Products Representative.



R561 — For heavy duty protection against highly toxic insecticides such as Systox, Parathion, Aldrin, Dieldrin, Chlordane, EPN, Nicotine, TEPP and HETP. Respirator protects against all dusts, mists, metal fumes and organic vapors. Approved by U. S. Dept. of Agriculture.



R563 — For heavy duty protection against metal burning fumes, acid gases, organic vapors—all dusts, mists.



R50 — For combination of all dusts, not significantly more toxic than lead. B.M.2156



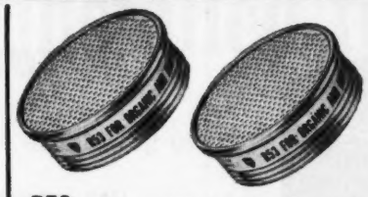
R50A — used with R50, converts to a dust and mist respirator. Protects against all dusts not significantly more toxic than lead, pneumoconiosis-producing mists, chromic acid mists. B.M. 2156 includes B.M.2156A



R51 — For light organic vapors and gases of paint spraying, degreasing, dry cleaning. B.M.2304



R52 — For acid gases, and mists of plating operations, pickling tanks, etc.



R53 — For combined acid and organic gases like carbon tetrachloride and acetic acid.



R54 — For protection against low or nuisance concentrations of ammonia.



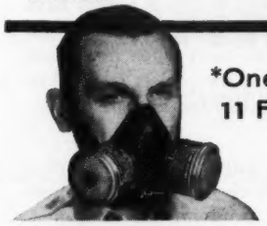
R55 — For those who are exposed to both organic vapors and all dusts not significantly more toxic than lead. B.M.2305



R56 — For fumes produced in welding, burning, smelting and refining. B.M.2163



R57 — For dusts, mists, fumes, significantly *more* toxic than lead including radioactive particulate matter.



*One Face Piece Takes 11 Filters and Cartridges

†T.M. Reg. by American Optical Company

American Optical
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

When inquiring check CP 8144 opposite last page

NEW

"Weld-Bilt" PRODUCTS

automatic
CONVEYOR-LIFT
ELEVATORS
speed your production flow!



One of three Weld-Bilt elevators in the automatic plant of a leading Television Manufacturer

Weld-Bilt Products Include:



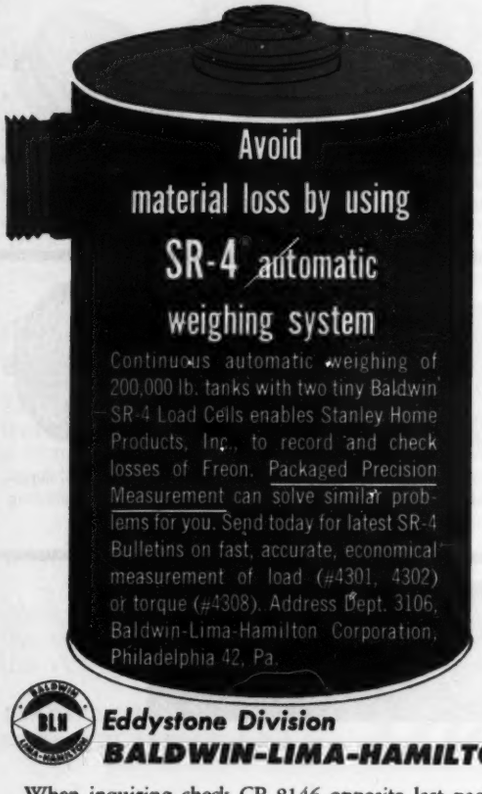


Here's a great time and man-saver where production flow demands *multiple-level* conveyor systems . . . It's a new Weld-Bilt development in AUTOMATIC Conveyor-Lift Elevators. Lifts or lowers packages or parts from one level to another, automatically selecting and lifting certain packages, passing others, if desired. Power rollers on lifting platform move load off in any required direction. All this is done without manual attention, to keep your production moving swiftly, without interruption.

The Weld-Bilt Automatic Conveyor-Lift can be built to any designed capacity, any height, with controls to handle any situation or need. Write today for details — or the services of a Weld-Bilt materials handling engineer. You'll save money, time, labor. Let us prove it!

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
322 WATER STREET, WEST BEND, WISCONSIN

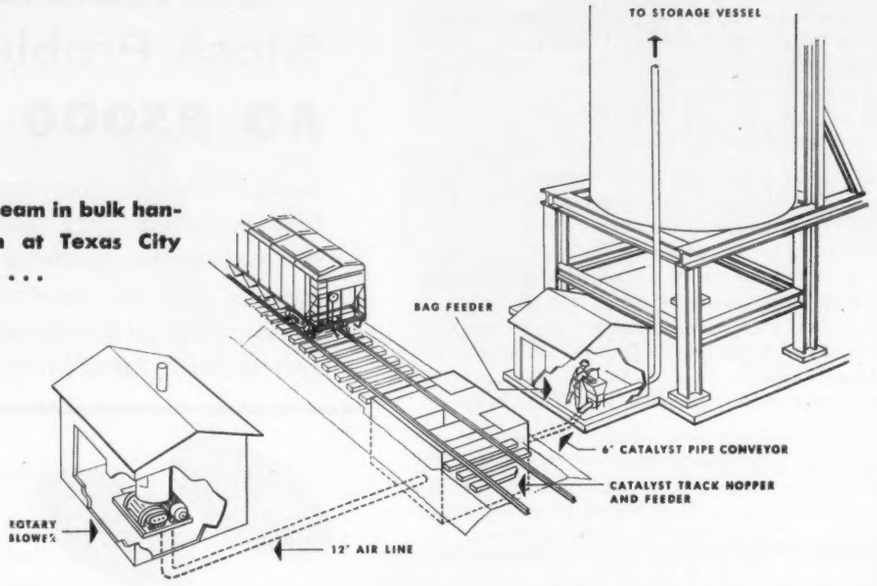
When inquiring check CP 8145 opposite last page



Eddystone Division
BALDWIN-LIMA-HAMILTON

When inquiring check CP 8146 opposite last page

Use of air stream in bulk handling system at Texas City Refining, Inc. . . .



cuts attrition loss to less than 1% in catalyst unloading

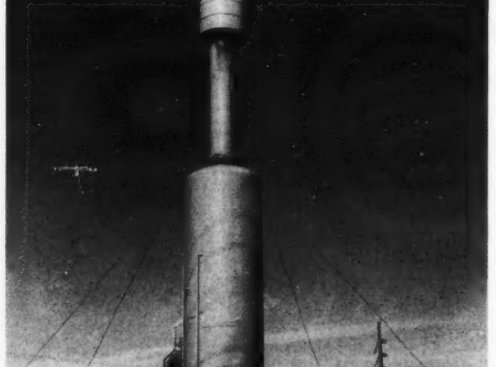
Unit reduces unloading time, is highly flexible, and requires little maintenance

D. E. FULLER
Technical Director
Texas City Refining, Inc.
with **RICHARD J. CALLAHAN,** Assistant Editor

At Texas City Refining, Inc., three or four tons of make-up catalyst are used each day in the world's largest Houdriflow catalytic cracking unit.

For catalyst they're using a pelleted natural clay calcined for hardness. The cylindrical pellets have 1/8 inch diameters and are 3/16 inch in length with bulk density of 55 lb/cu ft when dry. Since catalyst loses effectiveness if the pellets are broken up, moving the material calls for kid glove handling.

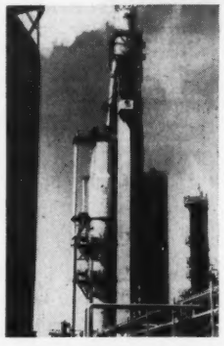
The catalyst comes in by hopper car and drops a short distance through a track hopper to an adjustable orifice and then to a moving air stream. A Sutorbilt blower moves the air stream at 55 ft/sec



Blower moves air stream at 55 ft/sec max and delivers seven tons of catalyst per hour when in operation



View of unloader under hopper car. Adjustable orifice allows operator to regulate speed at which hopper cars are unloaded



Catalyst unloader line going up Houdriflow tower. Line expands at top so that pellets just barely make height. This results in the pellets falling gently into the Houdriflow tower without being damaged

maximum and can move seven tons of catalyst per hour in operation through six inch pipes.

In order not to injure the pellets, line leading into Houdriflow tower expands at the top. This allows pellets to just barely make it over top of the unit before falling into Houdriflow tower.

Attrition loss is remarkably low. Tests have indicated that this loss is less than 1% on a No. 8 screen.

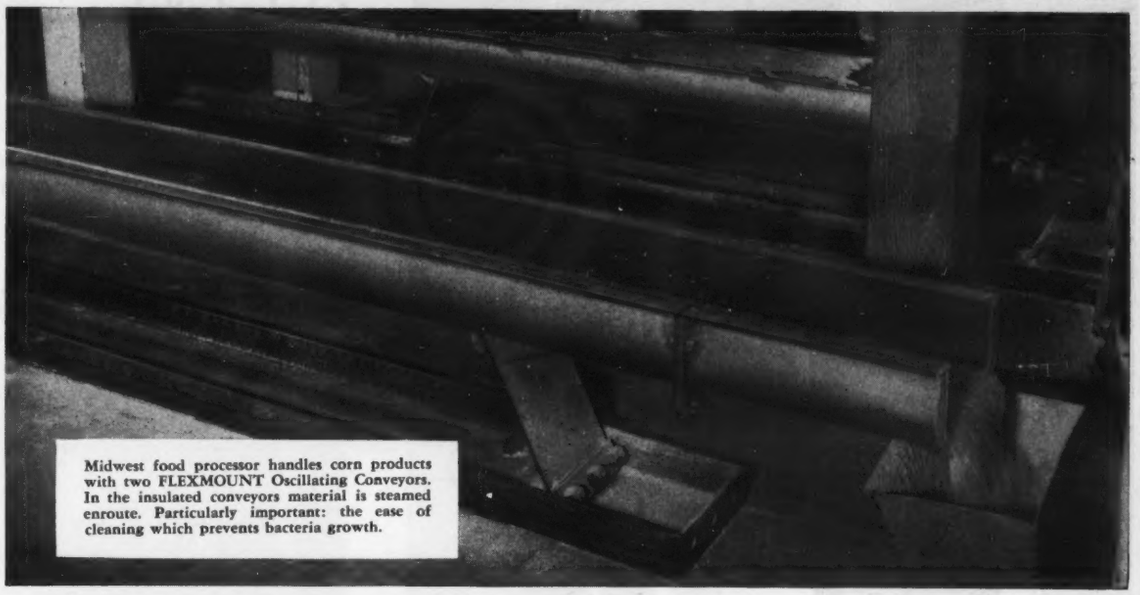
Use of the unloader has also resulted in cost savings. Since catalyst is $1.75 per ton cheaper by hopper car than in bags, and since Texas City Refining, Inc. uses 1150 tons of catalyst each year, there is a saving of approximately $2000 each year on cost of material alone.

Labor savings are even higher. It now takes just one man eight hours to unload a car. If material was received in bags it would take six men and one truck driver eight hours to unload the bags. This results in a saving of $7700 per year in labor or a total saving of $9700 per year.

Experimental work has shown that the unloader is quite flexible, that is, it could be adapted with very little change to materials of other sizes and specific gravity.

(Unloader was designed and constructed by Kaiser Engineers Div. of Henry J. Kaiser Co., Dept. CP, Kaiser Building, Oakland 2, Calif. . . . or check CP 8147 opposite last page.)

Low in cost! Highly effective!



Midwest food processor handles corn products with two FLEXMOUNT Oscillating Conveyors. In the insulated conveyors material is steamed enroute. Particularly important: the ease of cleaning which prevents bacteria growth.

FLEXMOUNT Conveyors can be installed from stock

Standardize on this versatile oscillating conveyor for your hard-to-handle materials

MASS-PRODUCED in standard lengths and standard widths, FLEXMOUNT Oscillating Conveyors cost far less than specially engineered units. They can be built up to any required length . . . from sections *carried in stock.*

FLEXMOUNTS are as easy to install as they are to order. Requiring an opening only slightly larger than the trough, they're a natural for restricted space. And the all-metal, leakproof trough has proved the low-cost and sanitary method for moving scores of hard-to-handle materials.

Get complete information on FLEXMOUNT Oscillating Conveyors from your nearby Link-Belt office or distributor. He can give you a "desk-top" demonstration of FLEXMOUNT efficiency. And be sure to ask for Book 2478.

How Positive Action moves material



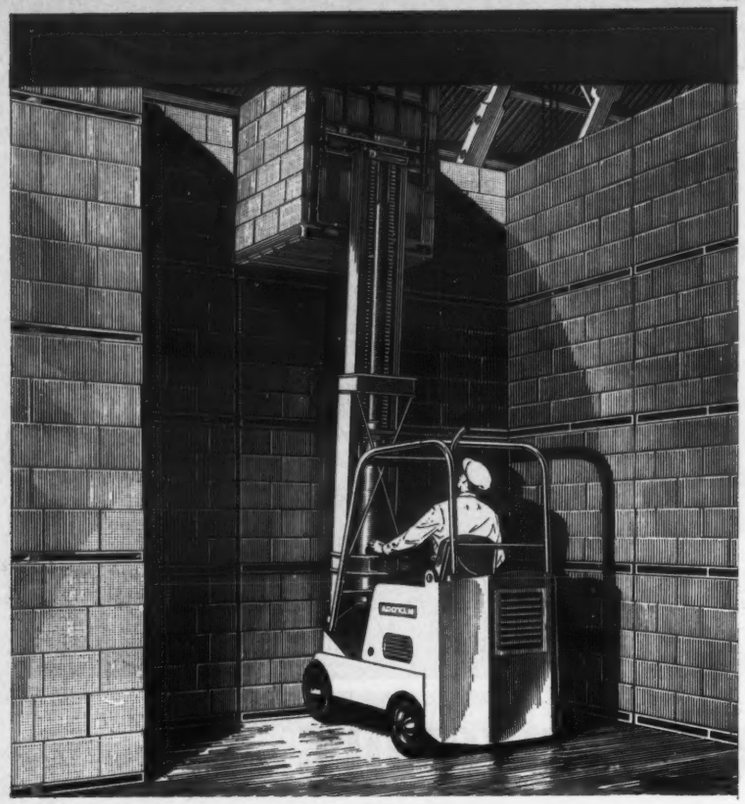
Positive-action, constant-stroke eccentric provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum.

LINK-BELT

FLEXMOUNT OSCILLATING CONVEYORS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 12,443

When inquiring check CP 8148 opposite last page



CHECK THE BOX AT THE BOTTOM

...to see how Gaylord Boxes save you money in warehousing. They make possible taller stacking to better utilize your valuable storage space. The superior materials and precision construction of Gaylord Boxes help prevent "stack-bottom bulge."

For proof of how Gaylord Boxes can protect your profit, as well as your product, call your nearby Gaylord office.

Gaylord Boxes

CORRUGATED AND SOLID FIBRE BOXES
FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

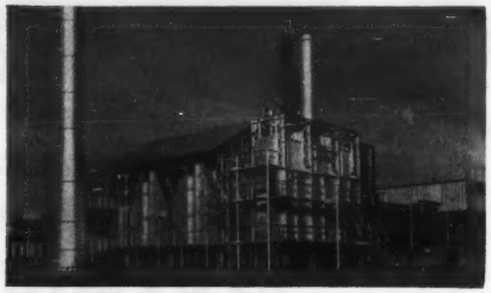
GAYLORD CONTAINER CORPORATION • ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

Cubed polyethylene conveyed in contamination-free operation

pneumatic conveyor moves cubes from plant to storage in completely enclosed system

At the Canadian Industries (1954) Ltd. plant in Edmonton, Alberta, polyethylene is produced in a ribbon four to five inches in width and subsequently cut into tiny cubes for packaging and delivery. Before packaging, the cubes are stored in four large silos in a separate building 200 feet away. When needed for packaging the material is removed from the silos, placed in multi-wall bags, and then loaded into boxcars.



Two aluminum pipe lines carry air-entrained material from polyethylene building to warehouse

To provide a contamination-free method of conveying the cubes from the plant to storage, a pneumatic conveyor system was installed. Using this

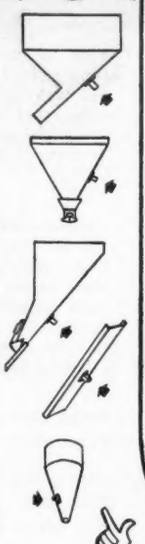


A general view of plant where gases used in manufacture of polyethylene are made

BIN STUCK LATELY?



If you're troubled with sticking, arching, bridging or settling conditions, just install a CLEVELAND AIR OR ELECTRIC VIBRATOR to positively solve the problem. All the items necessary to complete an installation are available in kit form . . . so easy . . . and costs so little.





What's the problem in your case? Just tell us . . . or ask for our detailed literature.

Cleveland can furnish both
AIR AND ELECTRIC VIBRATORS.

THE CLEVELAND VIBRATOR COMPANY

2706 Clinton Ave. • Cleveland 13, Ohio

When inquiring check CP 8149 opposite last page

system, polyethylene cubes are moved from the plant to storage in two aluminum pipes at the rate of three tons per hour.

Some advantages of such a system are:

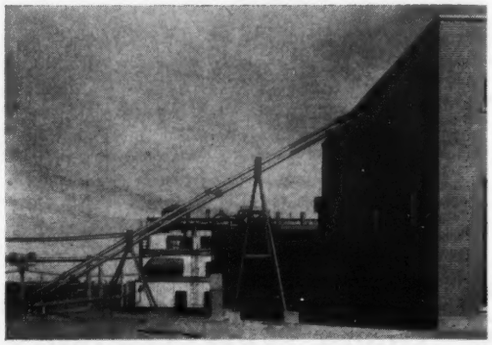
1) It is completely enclosed — no hands touch the material.

2) It conveys the material with a stream of air filtered before use, eliminating all possibility of contamination.

3) There is no metal-to-metal contact in the conveyor and hence no contamination from metal filings.

4) It is self-cleaning, requiring no shutdown for manual cleaning.

5) Air-entrained material is easily removed from conveying air by use of filters.



Start of the pneumatic system and conveying pipe lines are in the polyethylene building

One man operates the system on a part-time basis. Low maintenance, cleanliness, and simplicity of operation are other features of this system.

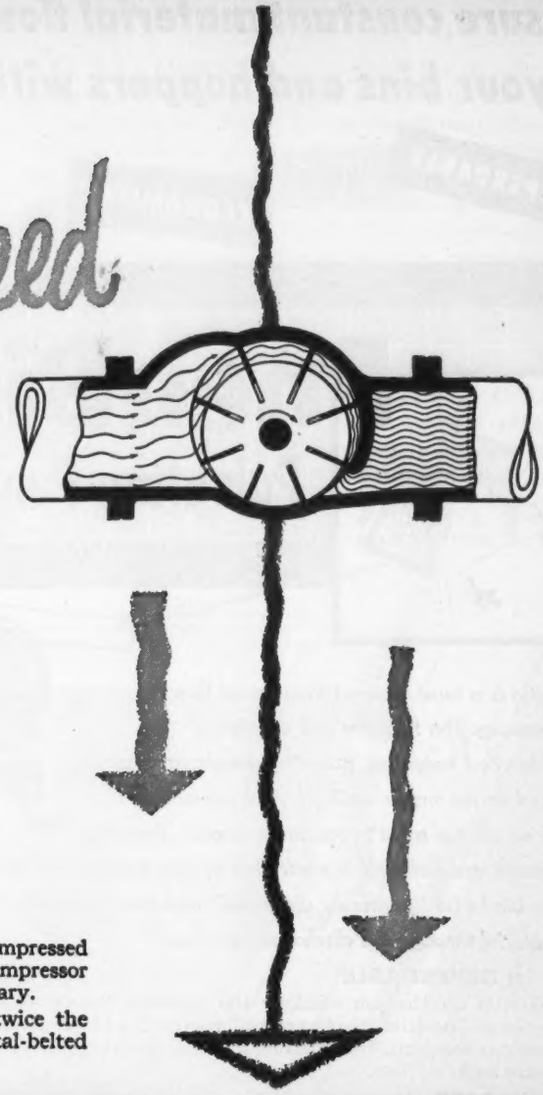
(Air-stream conveyor is a product of the Dracco Corp., Dept. CP, Harvard & East 116th St., Cleveland 5, Ohio . . . or for more information reader may simply check CP 8150 on the convenient Reader Service slip which is located opposite last page.)

Discusses pros and cons of truck leasing

The pros and cons of industrial truck leasing are discussed in four page folder. It covers such topics as effects on working capital, tax consideration, lease as a hedge against inflation, leasing versus borrowing capital, short term requirements and write-off in big profit years.

"Pros and Cons of Leasing" is available from the Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland 3, Ohio. When inquiring specify CP 8151 on handy form opposite last page.

When You need more AIR





When you require additional compressed air—and available space for a compressor is at a premium—try a Fuller Rotary.

Because it is a Rotary, it has twice the capacity of a comparative horizontal-belted reciprocating unit.

Because it is a Rotary, it is singularly lacking in vibration and requires only a nominal foundation.

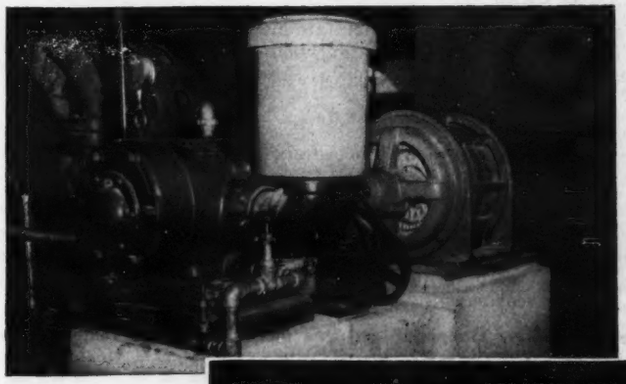
Because it operates at normal speeds, it is direct-connected and requires no cumbersome reduction gearing or belts.

Because of these things, you can put a Fuller Rotary in almost any unused corner, or on a balcony, or even suspended from the rafters, if need be.

So, whenever you are cramped for space and air, you can ease your problem by specifying Fuller.

Pressures to 125 psig; capacities to 3300 cfm.

Detailed information on design characteristics and typical applications will be forwarded promptly on request.



FULLER COMPANY, Catasauqua, Pa.

GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY

Chicago · San Francisco · Los Angeles · Seattle · Birmingham

1316
C-260

Fuller

. . . . pioneers in harnessing AIR

When inquiring check CP 8152 opposite last page

Assure constant material flow from your bins and hoppers with . . .



PneuBin is a new concept in material flow engineering. The PneuBin unit consists of steel-backed, neoprene, pulsating panels, strategically located on the inside walls of your present bins. Working off the plant's regular air supply, PneuBin is inflated and deflated in controlled cycles, causing the contents of the bin to be "positively displaced" and thus assures free flow of material through the discharge opening.

■ ***DEPENDABLE***

PneuBin is on the job *whatever* the material flow problem. PneuBin's principle of "positive displacement" moves the bin contents, not the bin . . . assures constant, free-running material discharge. *Depend on PneuBin to insure material flow.*

■ ***SAFE***

No manpower is needed to facilitate material flow from bins when PneuBin is on the job. No more prodding, poling or sledge-hammering. *Depend on PneuBin to insure material flow . . . safely.*

■ ***ECONOMICAL***

PneuBin cuts maintenance costs, saves money year after year. Reduce bin damage . . . increase bin life. *Depend on PneuBin to insure material flow . . . safely, economically.*

■ ***QUIET***

PneuBin pulsating panels breathe . . . not snore. No hammering or loud vibration noises. PneuBin's quiet operation adds to overall plant efficiency . . . reduces employee fatigue. *Depend on PneuBin to insure material flow . . . safely, economically, quietly.*

Send for "Flow Stoppage" and free literature. PneuBin engineers will gladly make recommendations with no obligation on your part.

PneuBin

A PRODUCT OF
GEROTOR MAY CORPORATION
1527 Maryland Ave., Baltimore 3, Maryland

When inquiring check CP 8153 opposite last page

MATERIAL HANDLING

Eliminates lubrication of conveyors

Uses: For overhead conveyors.

Features: Conveyor chains have dry lubricant impregnated pins and machined bearing surfaces on both inner and outer links. The dry lubrication cuts maintenance, avoids lubricant dripping and permits operation in temperatures ranging from −30° to 800°F. It also reduces tendency of dirt and dust to create abrasive action in chain joints.

Description: Drop-forged riveteless chains for overhead conveyor use are available in three pitches and five sizes. They are dimensionally interchangeable with other makes of conveyor chains. Each 10-ft chain length is held to a tolerance of −.000″ to plus ⅛″. Construction is of fine grain steel. Pins are coined after heat treatment to assure straightness and roundness.

(Conveyor chains are a product of U.S. Engineering Company, Dept. CP, 14561 Lesure Avenue, Detroit 27, Michigan . . . or for more information check CP 8154 on handy form opposite last page.)

Continuous drum dryer speeds handling of glue

Continuous single drum dryer has been developed to speed up drying of glue and gelatin. Continuous drying of glues in sheet form has been accomplished by providing means of maintaining uniform film on heated drum so it will dry quickly and be removed as a heavy dense product comparable to air-dried glue.

Variable speed drum drive and temperature controls permit production of glues of any quality without degradation.

(Dryer is a product of the Buflovak Equip. Div of Blaw-Knox Co., Dept. CP, Farmers Bank Bldg., Pittsburgh, Pa. . . . or for more information check CP 8155 on handy form opposite last page.)



Cuts handling costs in Darling foundry

Replacing other loaders of less advanced design, Auto-Scoops handle more materials, with less effort, reports Darling Valve & Mfg. Co., Williamsport, Pa. They're worked 18 hrs. a day on all kinds of sand handling, also bagged materials, drums, flasks, etc. Jaeger Auto-Scoops move bigger loads, turn shorter, carry faster, can dump higher and farther than comparable 12 cu. ft. loaders. Many other time-saving features. Write for Catalog L12-4.

JAEGER LOAD-PLUS auto-scoop 12 cu. ft.



Low bucket tilt-back assists full-bucket loading, permits carrying as low as 4½″ from ground.

5″ shorter turning radius (6′6″). Faster speeds to 13.88 mph in reverse, 7.66 forward.

Higher clearance (6′8″), more reach (2′7″).

1 cu. yd. Load-Plus available for bigger work.

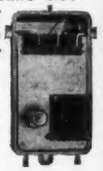
THE JAEGER MACHINE CO., 616 Dublin Ave., Columbus, 16, Ohio

When inquiring check CP 8156 opposite last page

ACCURATE

Lumenite Electronic LIQUID LEVEL CONTROLS

With no floats—no moving parts in the container (except non-conductive liquids) these Lumenite Electronic Liquid Level Controls maintain exact levels of water, milk, syrups, etc., in tanks, reservoirs, boilers, processors, freezers—either open or under high pressure.



Clean—Sanitary
Simple to Install
Require no Servicing

Write for
Bulletin FLM—on Liquid Level Controls
Bulletin ITC—on Ice Thickness Controls
Bulletin FN—on Non-Conductive Liquids

Lumenite Automatic TIMING CONTROLS



Lumenite Timers are the simplest, sturdiest and longest life. Accurate to fractions of a second, they speed and make more accurate all types of timed production.

For Details ask for
Bulletin LT—Standard Time Switches
Bulletin CR—Cycle Repeating
Bulletin PC—Program Clocks
Bulletin R—Time Delay Relays
Bulletin RMC—Auto. Reset Timers
Bulletin ET—Electronic Timers
Electronic or Electric Controls and Timers designed for special service.

Lumenite Electronic Company
407 S. Dearborn St., Chicago 5, Illinois

DEPENDABLE

When inquiring check CP 8157 opposite last page

Speeds up truck loading, is easily installed . . .

loader for 1½ ton trucks and up, has capacities of 2000 or 4000 lb

Tailgate loader has been developed which fits all 1½ ton and larger trucks. It requires no cutting or altering of cross-members and under-carriage for mounting. Capacities are 2000 and 4000 lb.



Tailgate loader of 2000 or 4000 lb capacity acts as both loader and tailgate. It installs easily on present equipment

Assembly is mounted on the rear of truck and operated hydraulically, simply lifting operator and load or hand-truck to the truck bed level and then closing as tailgate. It "lines up" with the truck, with overall height of mounting unit lower than top of truck tires.

When gate is level with truck floor, it locks in place. With gate in this position, safety lock on main cylinder holds it there even in case of power failure. If weight of 50 lb or more is on tailgate before complete closing, closing-jack power is automatically shut off.

Unit is designed for simple mounting. Entire tailgate assembly is hung on chassis members with two triangular steel plates. Hoist is mounted between and parallel to chassis members near cab.

Heavy chain connects hoist piston to tailgate mechanism and rides over a steel quadrant. As piston retracts, tailgate is raised. Small hydraulic cylinder is mounted next to quadrant and opens and closes gate. Both this and main cylinder operate from one pump and power take-off.

As a safety feature, loader has safety lock which truck operator must unlatch to start unit working. This prevents gate from being opened if anything is in the way.

(Loader is a product of the Converto Manufacturing Company, Dept. CP, Cambridge City, Indiana . . . or for more information reader may simply check CP 8158 on convenient Reader Service slip which is located opposite last page.)

Zips Bulk Materials Into a "Moving Pipe Line" to Prevent Degradation, Contamination, Dust

S-A "ZIPPER" CONVEYOR-ELEVATORS

for sealed handling of BULK FOOD, CHEMICALS, GRAIN

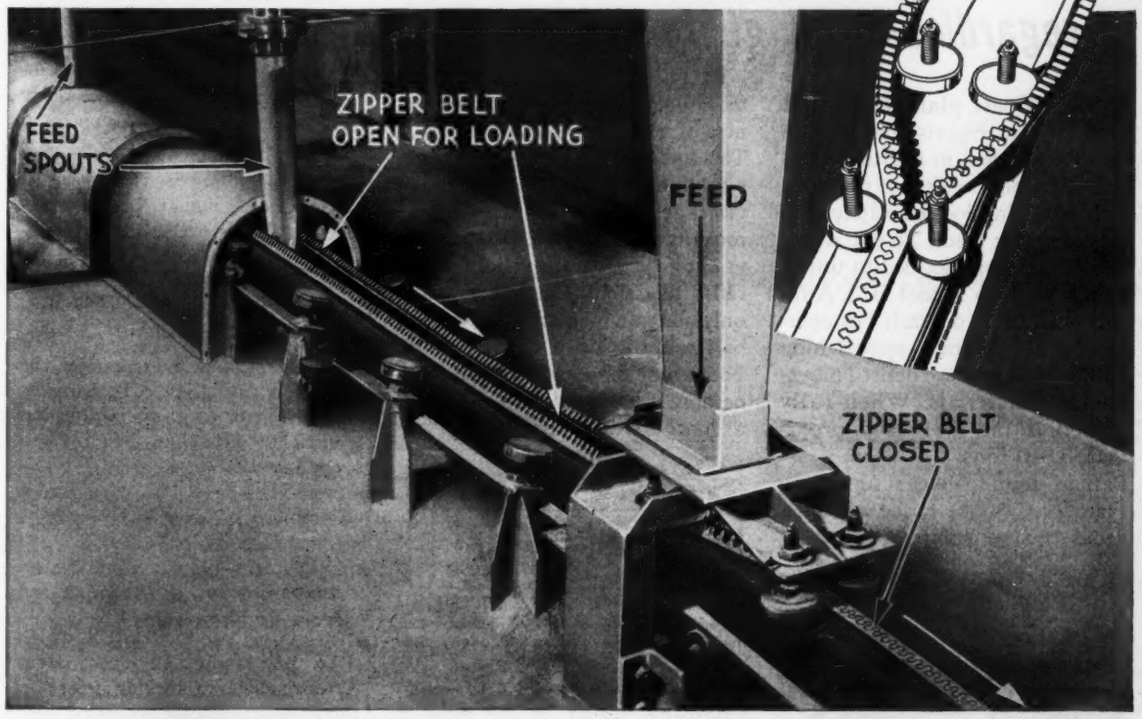
THE S-A "ZIPPER" Conveyor-Elevator seals bulk materials into a rubber "tube" that moves with the load. Conveys up, down or horizontally — in one or more planes — without crushing or packing granular, flaky, pulverized or lumpy materials. There's no agitation, no segregation, no abrasion against conveyor sides, no pressure exerted on the material to move it. The load is fully enclosed — there's no chance for spillage — dust is sealed in, contamination sealed out.

Complete Discharge

"ZIPPER" belt opens for loading and discharge. There are no pockets in which material can collect. "ZIPPERS" are equally suitable for long or short distance conveying and elevating in minimum space and with simple support. Power requirements are usually less than for conventional conveyors handling similar loads.

For more facts and typical arrangements, write for Bulletin 349.

"ZIPPER" is belt conveyor with rubber side-walls and teeth which are automatically spread, meshed and locked by rollers as belt travels past closing station. Also opens automatically.



SINCE 1901 S-A STEPHENS ADAMSON MFG. CO.

STEPHENS-ADAMSON MFG. CO.

11 Ridgeway Avenue, Aurora, Illinois • Los Angeles, Calif. • Belleville, Ontario

Engineering Division
Specialists in the design and manufacture of all types of bulk materials conveying systems.

Standard Products Division
A complete line of conveyor accessories including centrifugal loaders—car pullers—bin level controls—etc.

Sealmaster Division
A complete line of industrial ball bearing units available in both standard and special housings.

When inquiring check CP 8159 opposite last page



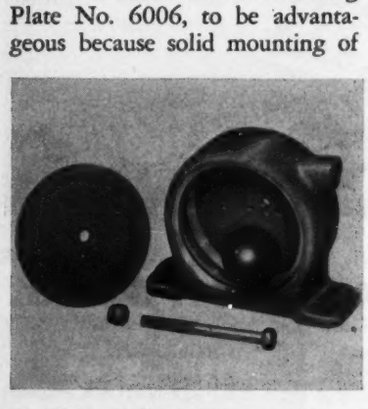
This simple ball type pneumatic vibrator operates dependably and effectively although exposed to temperatures between 600 and 750 degrees.

AiroViber moves bulk materials successfully regardless of high temperatures

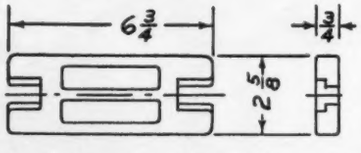
A West Coast plant of Barium Products Ltd reports they experienced a problem in moving materials from bins to electric furnaces, each bin being located adjacent to the furnace it feeds. To encourage free flow, it was decided to utilize vibration. Two Model B15 AiroViber vibrators on each bin operating in temperatures approaching 750 degrees produce desired movement of materials. When fully loaded, a bin weighs approximately 40 tons.

Barium found Viber's Mounting Plate No. 6006, to be advantageous because solid mounting of vibrator on bin increases effectiveness of vibration.

This modern method of external vibration can be used to good advantage in loading, unloading, moving, packaging, processing, grading or separating bulk materials. The simple design provides only one moving part, a heavy steel ball running on a circular track. Fool-proof operation is afforded because it has no close fitting parts to lubricate or adjust.



AiroViber's simple construction requiring no close clearances assures trouble-free operation.



Optional mounting plate simplifies mounting. Two T-slot bolts hold vibrator solidly against plate.

AiroViber is a product of Viber Company, leader in the field of vibration. For further information write: Viber Co.,726 So.Flower St. Dept. 79, Burbank, Calif.

VIBER CO.

CONCRETE VIBRATORS SINCE 1931

When inquiring check CP 8160 opposite last page

MATERIAL HANDLING

Brochure gives details on leasing equipment

Illustrated four-page brochure tells how materials handling equipment can be rented, leased, and purchased. Specifications of fork truck equipment available under plan, and rates for rental are included.

Bul 1107 is issued by Market Forge Co., Dept. CP, 35 Garvey St., Everett, Mass. When inquiring specify CP 8161 on handy form opposite last page.

Flexibility, speed are features of weigher-filler

Unit handles any free-flowing or semi-free-flowing material. It has discharge attachments so paper bags, plastic bags, boxes or canisters may be filled. It has range of weights from eight ounces to 25 pounds.

Speed of filling is as fast as 30 packages per minute. Unit occupies 2 x 4' floor space. It may be automatic with or without time delay on discharge for weight check, semi-automatic, or completely manual filling operation.

(Trescomatic is a product of the Trescott Co., Dept. CP, Fairport, N.Y. . . . or for more information check CP 8162 on handy form opposite last page.)

Saves loading docks from damage

To protect loading docks from damage due to backing trucks, a bumper made of compressed rubber has been developed. Bumpers can be mounted over wood with lag screws, or anchored to concrete docks.

(Kelco Bumpers are available from Kelley Co., Inc., Dept. CP, 316 E. Silver Spring Drive, Milwaukee 17, Wis. . . . or check CP 8163 on handy form opposite last page.)

UNIQUE

new

PORTABLE TELEPHONE UNIT

a complete intercom package



DESIGNED FOR SERVICE AND EMERGENCY CREWS

Lightweight and completely portable communications unit using Wheeler Sound Powered Electric Telephone Handsets, which require no batteries or outside power . . . the voice itself generates the current. This unit consists of two handsets, each equipped with 4-ft. Neoprene covered Koiled Kord retractile-type cables, 250 ft. of 2-conductor heavy duty Neoprene covered cable, and the special reel which is designed to permit clear, undistorted speech transmission at any distance up to 250 ft. even while unwinding. Additional 150 ft. of cable can be supplied and stored on reel if desired.

- NO BATTERIES
- NO MAINTENANCE
- NO OUTSIDE POWER
- TROUBLE-FREE SERVICE
- NO ELECTRICAL HAZARDS

Thoroughly engineered and service-proved equipment . . . rust and corrosion resistant. Write for full information.

WHEELER *Sound Powered Electric* TELEPHONES

THE WHEELER INSULATED WIRE CO., INC.

Division of The Sperry Rand Corporation

1112 East Aurora Street **Waterbury 20, Connecticut**

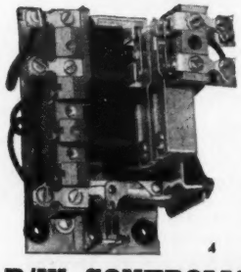
1WH55

When inquiring check CP 8164 opposite last page



All Electric FLOATLESS

LIQUID LEVEL CONTROLS



The original—pioneered by B/W in 1933. No floats! No moving parts in liquid. Literature describes relays and starters, automatic starter and relay combinations, multiple pump controls, special controls and panels and many application diagrams.

Controls not affected by pressures, temperatures, acids or caustics. Remote control if desired. Ice free electrodes where necessary.

4

WRITE FOR CATALOG

B/W CONTROLLER CORPORATION

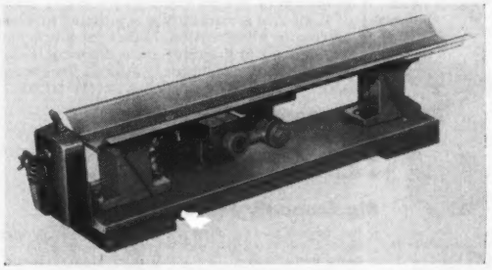
2204 E. Maple Road, Birmingham, Mich.

When inquiring check CP 8165 opposite last page

Uses solid blocks of rubber in place of springs in conveyor . . .

unit has rate of feeding or conveying from one to 60 ft per minute

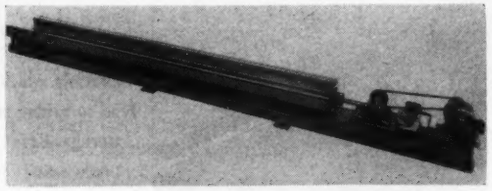
Vibrating feeding-conveyor uses solid, three-inch high blocks of rubber (neoprene) instead of



Vibrating feeder using neoprene blocks moves 150 tons of material per hour

coil or leaf springs. Metal strip is embedded in each neoprene mount at a 60° angle from the horizontal. This forces all movement in the mounts to take place at a 90° angle from the linear direction of the metal strip, with a 30° conveying angle of throw.

Conveyor has ⅛" stroke and rate of feeding or conveying can be varied from one to 60 feet per



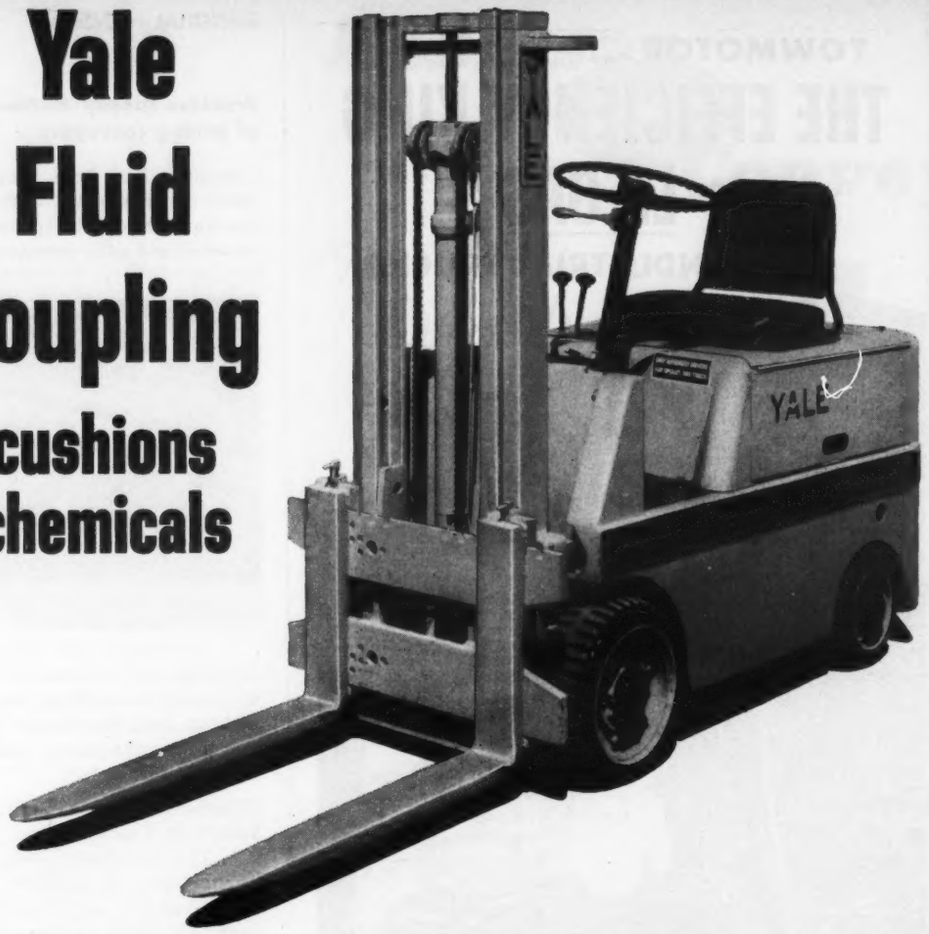
Conveyor unit has capacity of 20 tons per hour and eliminates spillage problem. Units have been constructed as low as 4 inches high for special uses

minute. Capacity is currently in neighborhood of 150 tons per hour. Attractive feature of unit is its quiet operation.

When used as conveyors, units are available with pans 6 to 24 inches wide and up to 30 feet long and with drives from ¼ to 5 horsepower. Pans are normally steel but can be specified in special metals. When used as conveyors, units have capacity of 20 tons per hour. There is very little maintenance with unit and no spillage problem.

(Resilient-Flow feeder-conveyors are product of the Carrier Conveyor Corporation, Dept. CP, 2144 Frankfort Avenue, Louisville, Kentucky . . . or for more information reader may simply check CP 8166 on the convenient Reader Service slip which is located opposite last page.)

Yale Fluid Coupling cushions chemicals



AND ONLY YALE OFFERS FLUID COUPLING IN A SHORT, 2,000-LB. GAS TRUCK!

Now receiving, storing, processing, warehousing and shipping operations can benefit from the jolt-free starts and jar-free stops possible with YALE Fluid Coupling. Available for the first time in a short, light-weight truck, Fluid Coupling cushions loads against rough handling damage...keeps the driver efficiently fresh all through the working day. This new 2,000-lb. truck—the latest addition to YALE's complete line of industrial lift trucks—can't be beat for all-around handling speed, safety and smooth efficiency. And here are some cost-cutting features that no other truck in the 2,000 to 4,000-lb. class can match:

Improved channel assembly gives free lift to 21", high lift up to 130". Channels mounted on ball-bearing equipped rollers for longer life with less maintenance. **Maximum power**—25 to 31½ hp.—for climbing ramps, carrying and lifting at lower, less wearing range of engine power. **"In line" gear shift on steering column.** Constant mesh transmission reduces gear clash. **Low cowl** for maximum visibility, accurate stacking, safer operation. **One-piece, removable hood** for easy access to entire engine. **Pneumatic or solid tires** for indoor or outdoor use.

To learn how you can put this new truck to work in your chemical processing operations, call a YALE representative today or mail coupon now.

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*Reg. U. S. Pat. Off.

Gas, Electric, Diesel & L-P Gas Industrial Trucks • *Worksavers* Warehousers • Hand Trucks • Hand & Electric Hoists

MAIL THIS COUPON TODAY

The YALE & TOWNE Mfg. Co., Dept. 127
Roosevelt Blvd., Philadelphia 15, Pa.
I would like to have additional facts about
☐ Gas Trucks ☐ Electric Trucks
☐ Worksavers ☐ Hand Trucks ☐ Attachments

Company_____
Name_____ Title_____
Street_____ City_____ State_____
In Canada write: The Yale & Towne Manufacturing Co. St. Catharines, Ontario, Canada

When inquiring check CP 8167 opposite last page

FORK LIFT TRUCKS AND TRACTORS SINCE 1919
Manufactured Only By Towmotor Corporation • The Pioneer Maker Of Fork Lift Trucks

TOWMOTOR...
THE EFFICIENCY KING
OF LP-GAS
INDUSTRIAL TRUCKS



Smooth Performance
Long Engine Life
No Objectionable Fumes
Low Fuel Cost
Long Oil Life
Less Maintenance

Towmotor LP-Gas Trucks offer a new high in performance and efficiency. Users save on fuel, oil and maintenance, because LP-Gas costs less, doesn't dilute crankcase oil and leaves no carbon or gum deposits.

For the highest efficiency in fork lift operation see your nearby Towmotor Representative . . . you'll find a complete line of constant power fork lift trucks for every requirement. Consult your Telephone Directory or write TOWMOTOR CORPORATION, Div. 2307, 1226 E. 152nd St., Cleveland 10, Ohio.

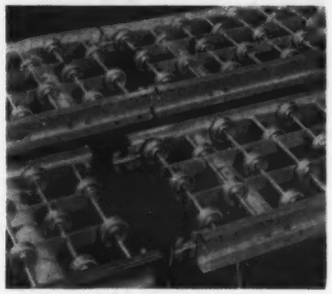
TOWMOTOR
THE ONE-MAN-GANG

When inquiring check CP 8168 opposite last page

MATERIAL HANDLING

Provides speedy method of joining conveyors

Coupling has been developed which provides quick method for joining most portable types of gravity wheel and roller conveyors. This



Coupling can be used on new or existing equipment

coupling can be installed so that it connects to existing conveyors without need of elaborate adapting. It connects conveyor units by dropping into place.

(Speedhooks are a product of Speedways Conveyors, Inc., Dept. CP, 134 Speedways Bldg., 202 Rhode Island St., Buffalo 13, N. Y. . . . or for more information check CP 8169 on handy form opposite last page.)

Describes line of feeders for granular materials

Illustrated bulletin of eight pages describes line of roll and vane feeders and rotary valves. These feeders are designed to handle dry pulverized and granular materials.

Bulletin includes descriptions of various feeders and lists materials handled by them, such as chemicals, powdered metals, grains and food products, biologicals, rubber, bone and wood products.

Bulletin F-5 is available from the Fuller Company, subsidiary of General American Transportation Corp., Dept. CP, Catasauqua, Pa. When inquiring specify CP 8170 on handy form opposite last page.

FOR ABSOLUTE SAFETY all over your plant use Safety GRIP-STRUT











the new basic material, all in one price (including channels), not welded, riveted or expanded in steel or aluminum, in standard sizes and gauges. Safety GRIP-STRUT presents an open space, in a diamond pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for work platforms, stair and ladder steps, flooring, balconies, catwalks, machinery guards, fire escapes and for original equipment safety treads.

Important Safety Features
★ Fire proof ★ Slip proof ★ Maximum strength ★ Minimum weight ★ Easy to stand on ★ Cool in summer—warm in winter

Big Economy Features
★ For balconies—no extra light needed below—no extra heat. ★ No extra supports necessary—channels are integral part of the material ★ No secondary sprinkler heads needed ★ Self-cleaning ★ Cut and installed like lumber by your own maintenance force ★ Low in original cost

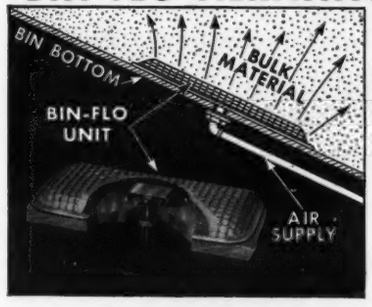
Distributors in all principal cities. Consult yellow pages in phone book under "GRATING."

SEND FOR NEW CATALOG

GRIP-STRUT division
THE GLOBE COMPANY • *Manufacturers since 1914*
4006 S. PRINCETON AVE. • CHICAGO 9, ILL.

When inquiring check CP 8171 opposite last page

BIN-FLO AERATING UNIT

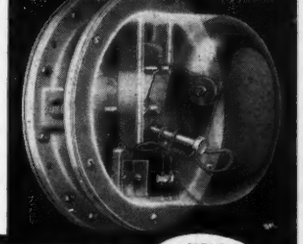


Provides Steady Flow of Dry, Finely Ground Materials which tend to bridge in storage. Uses only small amount low-pressure air.

BIN-DICATOR BIN LEVEL INDICATOR

For All Bulk Materials

signals change in level; automatically starts and stops filling and emptying equipment.

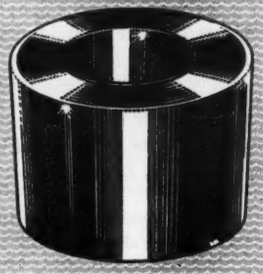


THE BIN-DICATOR CO.
13946-D Kercheval • Detroit 15, Mich.

NEW DETAIL DATA BOOK FREE

When inquiring check CP 8172 opposite last page

FOR
SUBMERGED
Oilless
BEARINGS
Specify
GRAPHALLOY



Works Where Others Won't!

- OPERATE DRY or SUBMERGED IN DYES; PLATING, CLEANING AND CHEMICAL SOLUTIONS; GASOLINE; FOODSTUFFS
- TRULY OILLESS AND SELF-LUBRICATING
- EXTREMELY DURABLE
- CONSTANT COEFFICIENT OF FRICTION
- APPLICABLE OVER A WIDE TEMPERATURE RANGE — even where oil solidifies or carbonizes
- EXTENSIVELY USED IN CONVEYORS, PUMPS AND OVENS
- ROTATING SEALS OF GRAPHALLOY ARE UNEXCELLED

GRAPHITE METALLIZING CORPORATION
1004 NEPPERHAN AVE. • Yonkers, New York
Please send data on Graphalloy SUBMERGED OILLESS BEARINGS.

NAME & TITLE
COMPANY
STREET
CITY ZONE STATE

When inquiring check CP 8173 opposite last page

Truck-mounted hoist tower is self-erecting, takes 200 lb . . .

unfolds like jack-knife to a height of 42 feet; sections can be added

Truck-mounted hoist tower is self-erecting and will support loads up to 200 lb. It has a loading height of 42 ft. If additional height is desired, five and ten foot sections can be added to unit with minimum effort.



Truck-mounted hoist folds into compact unit

It folds with a jack-knife action into compact unit. Platform is removable. Several companies are uilizing trucks obsoleted from other service as mounting base for hoist. Self-pumping concrete bucket and Chicago boom are optional.



Self-erecting hoist has loading height of 42 ft. Platform is removable

(Pelican hoist is a product of the Buck Equipment Corp., Dept. CP, 205 Butler St., Cincinnati. Ohio. . . . or for additional information about manufacturer's product, reader may simply check CP 8174 on convenient Reader Service slip which is located opposite last page.)

Robinson Air Activated Conveyor

The Low-volume Air Conveyor



▶ Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

Averages 1 Cubic Foot of Air per Pound of Materials Handled

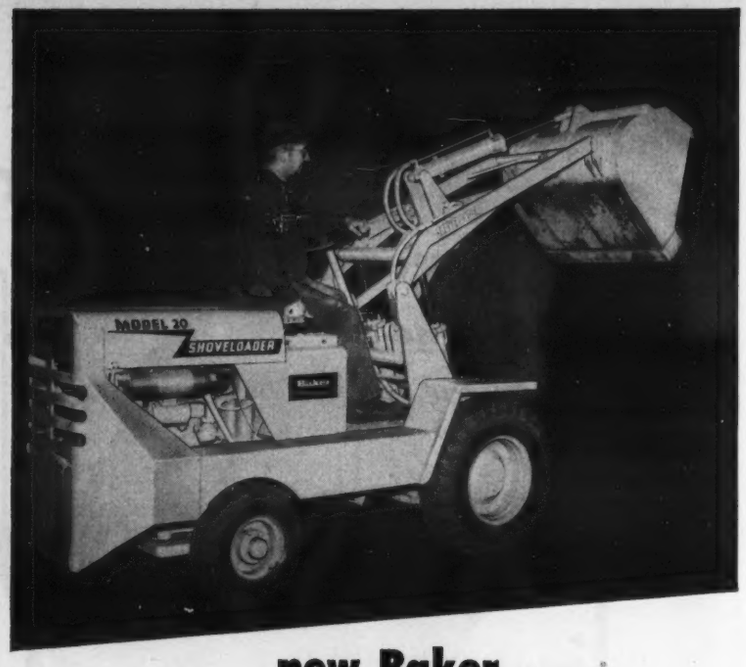
Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

ROBINSON Air Activated CONVEYOR SYSTEMS
A Division of Morse Boulger Destructor Co.
80 FIFTH AVENUE • NEW YORK 11, N. Y.
Representatives in Principal Cities

When inquiring check CP 8175 opposite last page



new Baker SHOVELOADER

saves up to $400 on initial cost

Now you can mechanize your bulk handling operations for less than $10.00 per day for one year . . . much less than you pay a laborer with a hand shovel!

This rugged Model 20 SHOVELOADER has a lifting capacity of 1500 pounds, and lifting height of 7 feet. Standard bucket size is 12 cubic feet. Loader arms are in *front* of operator—not around him—protecting him from injury and providing full 360° visibility at all times.

Four forward speeds with top travel speed of 14 MPH make this a *fast* machine and insure better operation on ramps and rough ground conditions.

Bucket tilt-back at ground level means a full load at every grab, and permits low carrying position for travel. Other advantages are longer forward reach, greater longitudinal stability, extremely low maintenance because of easy accessibility of all parts requiring service, and design of the husky, trial-proven engine.

Special attachments are available for special jobs—forks for palletized loads, crane hooks for hoisting, and special buckets for dense materials. Catalytic exhaust system is available for inside work, where required.

Compare these and SHOVELOADER'S many other features with loaders costing $350 to $400 more! Write for complete information. The Baker-Raulang Company, 1208 W. 80th St., Cleveland 2, Ohio.

Baker
HANDLING EQUIPMENT

5582

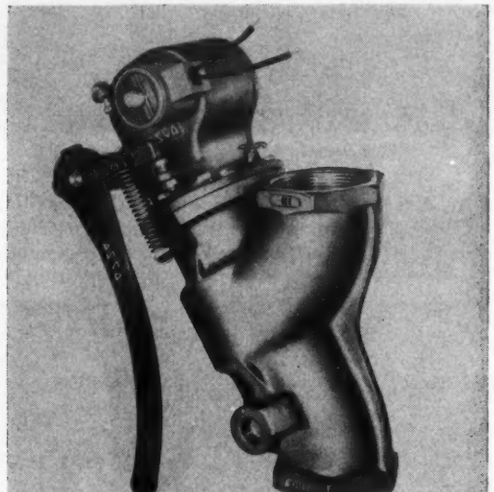
When inquiring check CP 8176 opposite last page

Controls the flow of gasoline, kerosene, Diesel and fuel oils in remote metering systems . . .

provides terminal dispatcher with complete control of all deliveries

Uses: For a meter-line of terminal's bulk loading remote metering system. Valve is designed to provide terminal dispatcher with complete and absolute control of all deliveries of gasoline, kerosene, Diesel and fuel oils.

Features: Valve eliminates need for separate shut-off valves as well as large pumps needed for additional pressure drops in system caused by separate shut-off valves. Remote metering system puts complete control of bulk plant operations in office; there is no need to walk back and forth between loading racks and office.



Eliminates unregistered deliveries of gasoline, kerosene, fuel oils, etc

Description: Usual operating procedure with bulk loading valve is as follows: dispatcher, in order to energize valve, must first insert a ticket into Remote Control Register to clear machine and energize the loading valve. Truck operator, through normal manual control, can then start filling without delay—adjusting the rate of flow when required. After truck operator finishes loading, dispatcher (by remote control) de-energizes solenoid valve so that no more oil can be drawn until new ticket has been inserted in register. Flow can be stopped by dispatcher at any time in case of accident or for any cause by simply de-energizing solenoid valve.

Valves are supplied standard with straight-through pipe connections; angle type bodies can be pro-



You can
LICK YOUR PROBLEM
easier when you
Go to JERGUSON
for Liquid Level
Gages and Valves

Here's why:

Complete Line of Armored Gages and Valves

Complete line of Armored Gages and Valves for handling hazardous or valuable liquids without fear of leakage or breakage.

Special Function Gages and Valves

Non-Frosting, Large Chamber, Heated and Cooled, Welding Pad, Remote Reading.

Choice of Materials and Linings

Gages and Valves made in stainless, monel, nickel, hastelloy, etc. Linings in rubber, neoprene, lead, Kel-F and other materials.

Other Variations to Meet Your Needs

Variety of close hookups; end, side or back connections. Valves available with quick-closing, double seating or throttling stem; vacuum tailpiece; connections flanged, socket welding, solid shank or spherical union. New design valves for instrument connection and sampling service.

Experience; Cooperation

Specialists in level indication where the service is hazardous, using special materials and construction, for any pressure. Progress based on working with men in the field. Jerguson engineers are ready and willing to help you with your problem . . . to develop exactly the right equipment for you.

Ask Jerguson to help on your problem, or write for General Catalog.

JERGUSON
Gages and Valves for the Observation of Liquids and Levels
JERGUSON GAGE & VALVE COMPANY
100 Fellsway, Somerville 45, Mass.
Offices in Major Cities
Jerguson Tress Gage & Valve Co., Ltd., London, Eng.
Pétrole Service, Paris, France

When inquiring check CP 8177 opposite last page

DE-LUMP CAKED MATERIAL to Speed Processing



Discharge: 1/2" to 4" — adjustable
Up to 500 Pounds per Minute

CRUSHES ANY MATERIAL
Hard, Soft, Resinous, Waxlike, Brittle, Lumped, Caked, Granular.

FOR WAX, SPONGE IRON and
Rosin, DDT, Resins, Asphalt, Salts, Glass, Chocolate, Asbestos, etc.

DESIRABLE OUTPUT, FEW FINES
Positive Chopping Action. Feed and Discharge are Automatic.

RUGGED, HEAVY DUTY "SUPREME"
Many in Continuous Service for 35 Years . . . Results Guaranteed.

Free Test Run — Send 50 Pounds
Your Material. Crushed to Desired Size, Returned.

Since 1918—"Supreme" Standard Crushers
Range of Standard Models to meet your needs; from $425. Immediate Shipment.

SUPREME CRUSHERS

Mfd. by Franklin P. Miller & Son, Inc.
36 MEADOW ST., E. ORANGE 2, N. J.

When inquiring check CP 8178 opposite last page

vided at additional cost. Valve operates in any position. Designed for hazardous locations, system's moving parts are made of nonsparking materials. Explosion-proof solenoids in accordance with Underwriters' Class I, Group D and NEMA VII requirements are supplied.

Vacuum-impregnated and moisture-resistant solenoid coils are designed for continuous duty and require only 10 watts for operation. Maximum operating temperature with unit is 160°F.

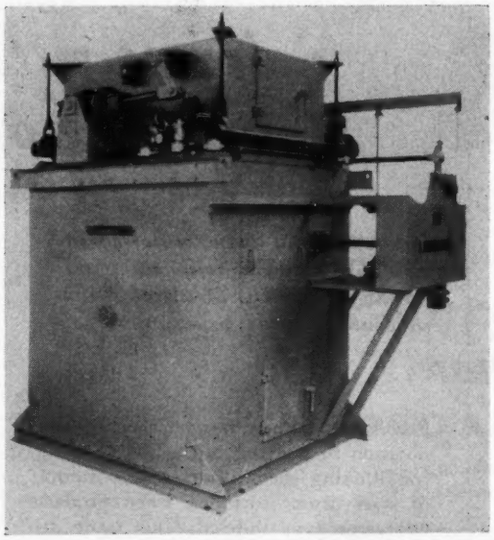
(Model 8023 Solenoid Valve is a product of the Automatic Switch Company, Dept. CP, 391 Lakeside Avenue, Orange, New Jersey . . . or for more information check CP 8179 opposite last page.)

Automatically weighs high tonnages of hot materials and ores

Uses: For weighing hot materials in high-tonnage quantities.

Features: Scale has extra-large hopper (25 cu ft), dust-tight housing, separately-housed controls, and 3/8" steel plate contacting material.

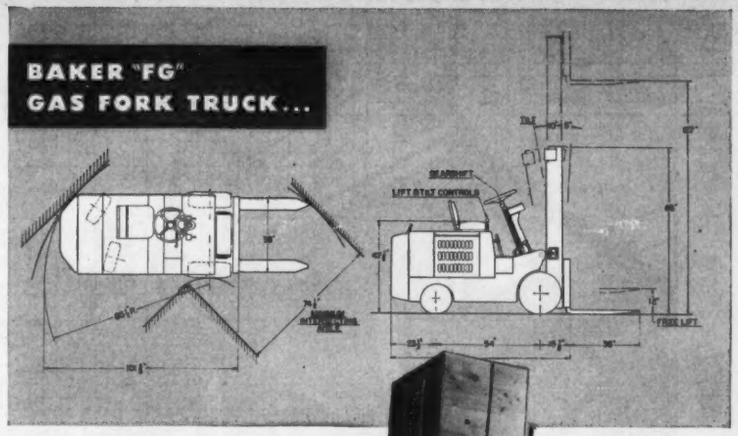
Description: Batching scale takes material (up to 2000 lb) into its hopper through inlet gate until weigh beam reaches balance position. Beam actuates limit switch that closes inlet gate, and discharges load from hopper. After discharging, inlet gate opens again and cycle is automatically repeated.



Automatic batching scale for hot materials and ores

(Scale is a product of the Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N.J. . . . or check CP 8180 opposite last page.)

BAKER "FG" GAS FORK TRUCK...



Dimensional Drawing of FG—60, 6000 pound capacity.



Why "BALANCED DESIGN" makes it the best!

"Balanced Design" means that every component be engineered to its specific function. Further that all elements be matched and coordinated to work together for top efficiency, maximum dependable service and longest life.

In the "Balanced Design" Baker FG Gas Trucks, for example, you get an integrated power train, consisting of drive axle, transmission and clutch, selected and engineered to be the best possible unit to perform its required function. Features include: compact rigid construction without troublesome universal joints, split clutch housing for easy accessibility, and *single oil supply for entire assembly.*

"Balanced Design" also assures you that the power plant is not merely an automotive engine modified for truck use. It is a heavy-duty industrial engine specially engineered for rugged industrial truck service and built by an outstanding manufacturer. Our specifications call for moving parts to balance much closer than ordinary engine parts: pistons balanced to ± grams instead of ounces, crankshaft to 4 inch-ounces and connecting rods to 2 grams.

These are some of the reasons why Baker "FG" is the only gas fork truck with a full 6 months' warranty, and why we say "BALANCED DESIGN" makes it the best.

Baker "FG" gas fork trucks are available with 3,000, 4,000, 5,000 and 6,000 pound capacities. Specific bulletins can be obtained by writing The Baker-Raulang Co., 1208 West 80th Street, Cleveland 2, Ohio.

8 Reasons Why The Baker FG Fork Truck Is First In Its Class . . .

1. LOWER INITIAL COST—FG-40 (4000 lb.) $4295. Other models at proportionate savings.

2. LONGER WARRANTY PERIOD—Baker quality permits full 6 months' warranty.

3. HIGHER LIFT—Mast design allows higher standard lift than ordinary trucks.

4. LOWER MAINTENANCE COSTS—Designed for easier and less frequent servicing.

5. MORE MANEUVERABLE—Short turning radius cuts aisle width, adds floor space.

6. EASIER TO OPERATE—Greater visibility . . . easy-to-work controls.

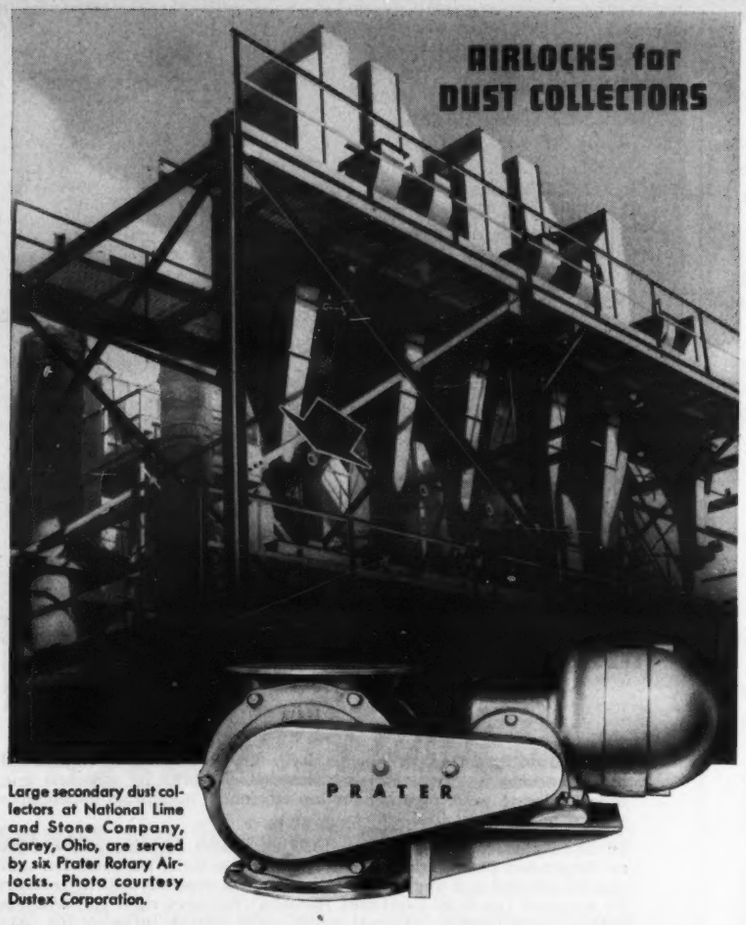
7. GREATER STABILITY—Lower center of gravity . . . higher "stability factor" ratio.

8. BETTER BRAKING—Full floating, self-equalizing, self-energizing brakes.

Baker HANDLING EQUIPMENT

5G6

When inquiring check CP 8181 opposite last page



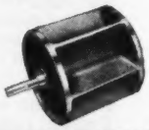
Large secondary dust collectors at National Lime and Stone Company, Carey, Ohio, are served by six Prater Rotary Airlocks. Photo courtesy Dustex Corporation.

PRATER ROTARY AIRLOCK FEEDER

important in the process plan

. . . for increasing efficiency of dust collectors, bag filters and spray dryers. The closed-pocket rotor design with blades and side-plates as one unit, together with double shaft seals and extra sturdy construction, not only insures better air seal ...it definitely means smoother and better operation of such equipment.

Available in 8, 10 and 12-inch sizes, the Prater Airlock Feeder saves money in handling practically any finely ground or granulated material including the most highly abrasive substances. Write for illustrated brochure.



CLOSED POCKET ROTOR
Side plates and rotor blades are cast as a single unit for better sealing and longer life. Recommended for both soft and abrasive materials.



OVERSIZED BEARINGS
Self-contained, extra large self-aligning bearings lubricated and sealed for life. Standard on all heavy duty Prater Rotary Airlock Feeders.



WHAT'S YOUR PROBLEM? Jot down the details of your application and mail to us. Our engineers will help you plan your flow-sheet and specify proper equipment.

PRATER PULVERIZER COMPANY
1513 S. 55th Court, Chicago 50, Ill.

When inquiring check CP 8182 opposite last page

packaging



Phenolic-lined steel drums lined up for filling at Wright Chemical Corporation

When other packaging methods failed, Wright Chemical Corporation of Chicago turned to

drums with built-in product protection

Phenolic lining keeps water-conditioning chemicals pure by eliminating possibility of discoloration or contamination by container

Problem: When Wright Chemical Corporation first introduced a line of water-conditioning chemicals in 1946, interiors of steel drums corroded when products were stored or shipped. This made discoloration, contamination, and loss of product a possibility. Although the water conditioning chemicals inhibit corrosion and prevent scale and algae when diluted for use, they were found to be incompatible with steel in the concentrations necessary for shipment.

Some of the corrosion-inhibiting chemicals produced which require linings are: the Wrikorg Series, a blend of organic colloids for prevention of scale in sugar evaporators; Wrytal 80, a blend of colloidal material plus heavy metal ions, for biocidal and algaecidal applications; Inhibicide 59, a combination chrome-based corrosion inhibitor and slimicide, for recirculating-water cooling systems; and Wrico NDR, one of a series of complex alkyl aryl biocides for use in cooling systems.

Unlined steel drums first used for shipping these products were quickly found to be unsatisfactory. An attempt made by the company to line their own drums also did not provide the answer.

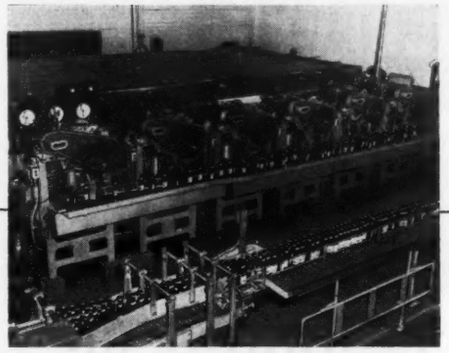
Solution: Problem was turned over to a steel drum manufacturer who supplies specially-developed linings for steel drums. Samples of Wright products were sent to be tested. After a series of cup tests, con-

tinued for a period of one year and checked every month, high-baked phenolic lining IC-25 was recommended for the entire product line.

Results: Phenolic-lined 55-gal containers supplied by drum manufacturer have proved satisfactory in all instances. Wright chemicals reach their destinations in pure condition, without leakage. Not one instance of a drum-lining failure has occurred since the containers were placed in service several years ago. Drums in use at present are lithographed, which adds considerably to the attractiveness of the container.

(Steel drums and high-baked phenolic linings are products of Inland Steel Container Co., Div. of Inland Steel Co., Dept. CP, 6532 S. Menard Ave., Chicago 38, Ill. . . . or for more information check CP 8183 on handy form opposite last page.)

no down-time here . . .



high-speed bottling maintained with plenty of reserve

Centralized feed and discharge unite six labelers as one in 400 bottle-per-minute operation

These six machines pictured above, arranged in tandem, label 360 12-ounce bottles per minute at Falstaff Brewing Corporation's Plant No. 6 in San Jose, Calif., with plenty of reserve production capacity to meet any contingency. A centralized feed and discharge evenly and gently distributes bottles in parallel into each unit.

Since bottling line speed is maintained even when one labeler is temporarily inactive, scheduled production is assured. Labeler has line capacity up to 400 bottles per minute.

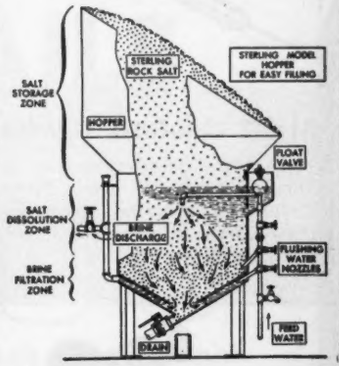
(This World six-unit tandem labeler is manufactured by the Economic Machinery Corporation, Dept. CP, 60 Fremont St., Worchester 3, Mass. . . . or for more information check CP 8184 on handy form opposite last page.)

BRINE HEADQUARTERS

The great mines . . . the refineries . . . the years of teamwork with all brine-using industries . . . enable International to provide the equipment, methods and know-how to make better brine at lower cost with greater efficiency . . . in any plant . . . for any industry.



THE STERLING MODEL LIXATE ROCK SALT DISSOLVER



From Sterling Rock Salt or Evaporated Salt

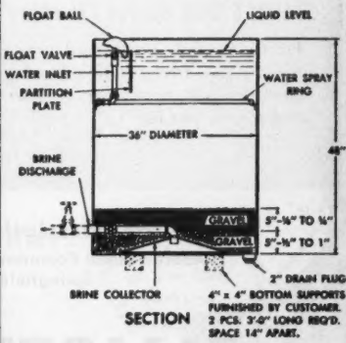
BRINE, AUTOMATICALLY MADE . . . ALWAYS SATURATED . . . PIPED TO ALL POINTS OF USE

For consultation without obligation, with a qualified International Industrial Engineer, write . . .

INTERNATIONAL SALT COMPANY, INC.
INDUSTRIAL DIVISION • SCRANTON 2, PA.

SALES OFFICES: Atlanta, Ga. • Chicago, Ill. • New Orleans, La. • Baltimore, Md. Boston, Mass. • Detroit, Mich. • St. Louis, Mo. • Newark, N. J. • Buffalo, N. Y. • New York, N. Y. Cincinnati, O. • Cleveland, O. • Philadelphia, Pa. • Pittsburgh, Pa. • Richmond, Va.
ENGINEERING OFFICES: Atlanta, Ga. • Chicago, Ill. • Buffalo, N. Y.

THE STERLING EVAPORATED SALT DISSOLVER

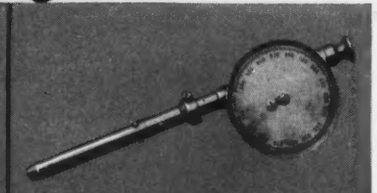


When inquiring check CP 8185 opposite last page



NEW ELLIOTT TUBE GAGE

Measures inside tube diameters in .001". A quick, guide for setting tube expanders for condenser and heat exchanger tubes. Three point contact of hardened steel balls insures accurate measurements.



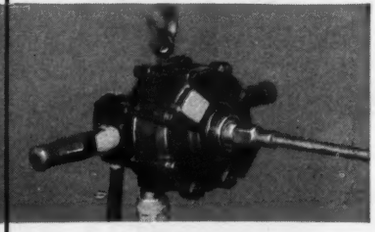


ELLIOTT TUBE EXPANDERS

Roll condenser and heat exchanger tubes quickly and accurately. Rotating, parallel self-feeding rolls insure good joints. For tubes ½ in. through 1½ in.

ELLIOTT CONDENSER CLEANER

Direct-drive air-driven cleaner using shaft and drill heads. Motor supported outside the tube by overhead pipe. Also available with electric motor.





ELLIOTT JIFFY GUN

Shoots nylon or rubber plugs through small tubes for rapid cleaning. Operated by inserting nozzle into tube end and pushing.

ELLIOTT 600 Series Cleaners

For straight and curved small tubes. Air or steam driven motors. Can be equipped with expanding brushes and scraper heads.



Y4-16

Write for Descriptive Bulletin Y-38

Address Elliott Company, Lagonda Division, Springfield, Ohio



ELLIOTT Company

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

When inquiring check CP 8186 opposite last page

PACKAGING

Production speeded by round container labeling unit . . .

semi-automatic machine is easily cleaned

Uses: Automatic labeling of all types of round containers from quart sizes and smaller to 5-gallon cans.

Features: Unit incorporates an automatic label feed and a pivoted frame which opens for easy cleaning. Changeover from one size container to another is fast and automatic label feed reduces operator's work in removing labeled cans or bottles from machine.



Changeover to new container size is fast

Description: Labeler for round containers is constructed throughout of corrosion-resistant metals. It will handle labels from 2" high x 3" long to 12" high x 18" long.

(Labeler for round containers is a product of The Atlantic Supply Company, Dept. CP, 16 N. Greene St., Baltimore 1, Md. . . . Check CP 8187 opp. last page.)

Polyethylene packaging advantages listed

Folder of six pages lists physical qualities and characteristics of polyethylene and its advantages as a sales and protective package, and describes various polyethylene bag constructions that are available.

"Packaging for Sales in Polyethylene" is issued by Bemis Bro. Bag Co., Dept. CP, 408 Pine St., St. Louis 2, Missouri. Check 8188 opposite last page.



Coppus Airplane Type Heat Killer® **cools large areas — restores efficiency**



HEAT KILLER on the job in drop forge plant.

Steel mills, drop forge plants, foundries and other plants with hot working conditions find this Coppus Heat Killer increases worker efficiency . . . at reasonable cost. *A single fan cools large areas.*

Other types also available for cooling furnaces, electrical equipment, for driving out gases, drying out products, drawing out fumes. Write now for detailed information. COPPUS ENGINEERING CORPORATION, 387 PARK AVENUE, WORCESTER 2, MASSACHUSETTS.

ANOTHER COPPUS "BLUE RIBBON" PRODUCT

When inquiring check CP 8189 opposite last page

J. E. SIRRINE CO.

GREENVILLE • SOUTH CAROLINA

Engineers

ESTABLISHED 1902

PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL • METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL • WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

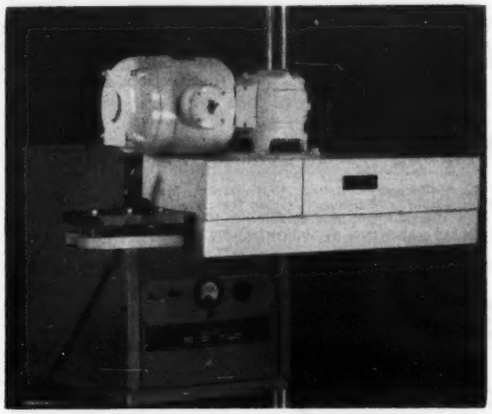
When inquiring check CP 8190 opposite last page

Electronic bag-top welder can be coordinated with filling line . . .

unit operates continuously, gives high-speed closure when fed automatically or by hand

Uses: High-speed closure of heat-sealable bags, especially where there is need for such equipment to be integrated with filling line.

Features: Filled open-top bag is fed automatically or by hand into one end of sealer where it is gripped by continuously-moving belt and carried through unit. Uniform seal can be made across top of bag of any width. Welding is accomplished by continuously-firing high-frequency electrodes.



Will heat-seal bag tops of any width

Description: Weighing 220 lb, bag-top welder has these dimensions: length, 35″; width, 33″; height, 60″. Bag speeds available range from 60 fpm to 30 fpm, with welding power easily controlled by associated generator.

(Model 525 electronic bag-top welder is a product of Electronic Processes Corp., Dept. CP, 1047 San Antonio Rd., Los Altos, Calif. . . . or for more information check CP 8191 on handy form opposite last page.)

Interior packaging material is economical

Economical, easy-to-use interior packaging material is described in series of bulletins. Numerous pictures illustrate variety of uses to which this material can be put.

Bulletins on Kimpak are issued by Kimberly-Clark Corp., Dept. CP, 4500 N. Commercial, Neenah, Wisconsin. When inquiring specify CP 8192 on handy form opposite last page.

Make friends with Continental's steel containers



Rust-proof re-usable

FLARING PAILS

Inside and out, Continental steel flaring pails are built to give your dry, powdered and viscous products the fullest measure of protection. Sales appeal, however, is just as much a part of these pails as sturdy construction. Brightly lithographed by Continental craftsmen, each container becomes part of a handsome package "family." And long after the original contents are gone, your name on these handy re-usable pails will help you sell not just one, but *all* the products in your line. Let us show you how Continental flaring pails can work for you. Call anytime.

Why not order "Tripletite" paint cans, "F" style and conventional cans when you order steel containers? We'll make up a "mixed" freight car to cut your costs on shipping, warehouse space and inventory.

A COMPLETE LINE—FIRST IN QUALITY

Durable, handsome Continental flaring pails available in 10 lb., 3½, 4, 5, and 6½ U. S. gallon sizes. 29-, 28-, or 26-gauge steel throughout. Bottom compound lined with 5 thickness strength for extra protection. Cover has deep gasket groove and full skirt to provide a sure seal. Beads near top, bottom or both for greater rigidity and strength. Covers specially designed to prevent sticking or jamming in storage. All pails nest snugly for economical shipping.

Continental makes a full line of closed head drums, lug cover pails and utility containers. Whatever your needs; Continental will supply the sizes and styles that fit your products best.

CONTINENTAL CAN COMPANY

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Central Division: 135 So. La Salle St., Chicago 3
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Our Fiftieth Year of Tailor-Made Packaging
TAILOR MADE PACKAGE SERVICE

When inquiring check CP 8193 opposite last page

VULCAN

STEEL PAILS

in all Trade Styles and Sizes

1-15 GALLONS

LUG CLOSURE POURING PAILS

Combination shipping and dispensing containers which insure safe delivery of your products and convenience in using them. Full opening for easy filling. Made of fine quality steel on modern production equipment to exacting standards.





DRUM-TYPE CLOSED-HEAD CONTAINERS

Required for the shipment of many thin liquids, these Vulcan containers have welded side-seam, top and bottom double-seamed, and are offset at the top for solid stacking.

STANDARD LUG-CLOSURE PAILS

Made in a wide range of trade sizes for liquid, dry and solid products, these sturdy pails have accurately formed cover lugs which are crimped beneath the curled rim of the pail to make a closure which defies all shipping hazards.



HI-BAKE LININGS — POURING NOZZLES AND SPOUTS— Hi-Bake Linings are applied under the control of scientific instruments and are available in all styles of Vulcan pails and drums. Pouring openings may be had with Push-Pull Spouts and either screw or U-Pressit caps with tamper-proof seals—with reversible, flexible polyethylene spouts or other popular pouring nozzles and spouts as required.

Samples gladly sent upon request

Over 35 Years of Top Quality Containers
"It's Better to Ship in Steel"

VULCAN STAMPING & MFG. CO.
P.O. Box 161, Bellwood, Illinois (Suburb of Chicago)
In Toronto, Canada—Vulcan Containers Limited
Representatives in All Principal Cities

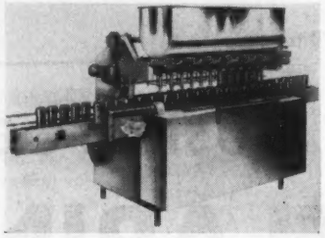
When inquiring check CP 8194 opposite last page

PACKAGING

Fills viscous products more accurately, faster

Uses: Filling semi-liquid and semi-solid products into as many as 300 glass, plastic, or metal containers a minute.

Features: Air-operated valves cut off instantaneously regardless of cycle speed, and greater accuracy of fill is provided since valves themselves are air-free.



Filling machine handles ½ to 32-oz containers

Description: Filling machine can be constructed to handle from ½ to 32-oz containers and fills cosmetics, pharmaceuticals, petroleum, and chemical products, as well as food products. All contact parts on unit and parts around filling zone are of sanitary stainless steel construction and easy to clean.

(Model SL-55 semi-liquid filling machine is a product of The Filler Machine Co., Inc., Dept. CP, Philmont Club Station, Philmont, Pa. Check CP 8195 opposite last page.)

Speeds carton sealing

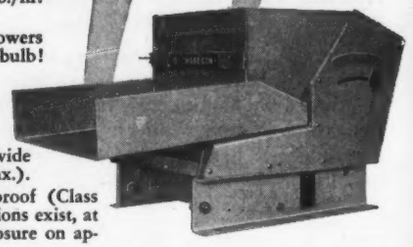
Series of electrically- or manually-operated tape-dispensing machines, designed to speed package-sealing operations, is pictured and described in four-page bulletin.

Bulletin on Nashua Tay-pers is available from Nashua Corp., Dept. CP, 44 Franklin Street, Nashua, New Hampshire. When inquiring specify CP 8196 opp. last page.

VERSATILE BULK FEEDING...
from a *trickle* to a *torrent* with VELOFEEDER

A mechanical vibrating feeder especially designed for free-flowing chemicals, fertilizer, pellets and similar materials at lower cost, higher efficiency.

Here's Why!



Higher Output—300 to 50,000 lb./hr. hard granular materials; 300 to 30,000 lb./hr. soft ground materials.

Lower Power Needs—⅛ hp. motor powers unit—inexpensive as a 100-watt light bulb!

Smaller Space Needs—35 inches long, 17½ inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

Easier Control—simple adjustment over wide operating range (near 0 to 50 fpm. max.).

Safer Operation—motor is explosion-proof (Class 2, Group G), where hazardous conditions exist, at slight extra cost. Complete dust enclosure on application.

Less Vibration—working frequency is 1850 vibrations per minute; little or no vibration is transmitted to mounting installation (mounts with only 4 bolts!).

If you're interested in better bulk feeding at lower operating cost, write for Bulletin 5302 with complete specifications and drawing.

1092

Richardson SCALE COMPANY, Clifton, New Jersey

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MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 8197 opposite last page

FOR FLEXIBLE CONNECTIONS
IN
● DUST COLLECTION ● FUME CONTROL
● AIR-CONDITIONING ● MATERIALS HANDLING

PORTOVENT® Spiral wire reinforced ◀◀◀ USE ▶▶▶ FLEXAUST® Spiral wire reinforced

DUCT



Sizes 3" to 36" ID
Wide Pitch type
RETRACTABLE

Flexaust hoses and Portovent ducts are made with strong cotton or nylon fabrics, impregnated and coated with neoprene compounds. Seams are fully bonded. Other important features are—

✔ EXTREME FLEXIBILITY
✔ AIRTIGHT — STRONG
✔ LIGHTWEIGHT — DURABLE
✔ VERY EASY TO HANDLE AND INSTALL

DISTRIBUTORS IN PRINCIPAL CITIES

HOSE

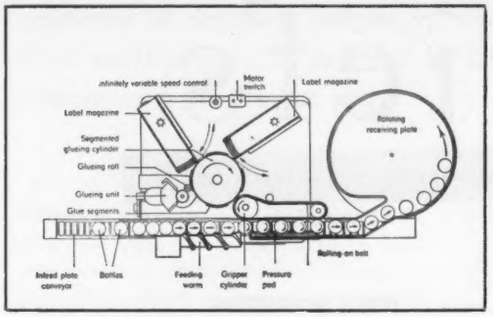


Sizes 1¼" to 36" ID
Close pitch type

WRITE TODAY FOR
Bulletin #40 — General Information
Bulletin #41 — Accessories and Installation Data
Bulletin #42 — Technical data on products and service.
Bulletin #43 — Application data and type selector guide.
Bulletin #44 — Friction loss data.
Price lists.

THE FLEXAUST COMPANY, Dept. CP-7
100 PARK AVENUE NEW YORK 17, NEW YORK

When inquiring check CP 8198 opposite last page



Schematic diagram showing operation of high speed German labeling machine

German labeling machines handle up to 18,000 bottles per hour

units are now available in this country

High speed Jagenberg Lightning labelers, until recently made only in Germany, are designed for automatic application of body labels to round bottles and jars. The Lightning I model has single label magazine, is rated at speed of about 160 per minute (10,000 per hour). Lightning II model is equipped with two label feeds, attains speeds of 250 to 300 per minute, depending on label width.



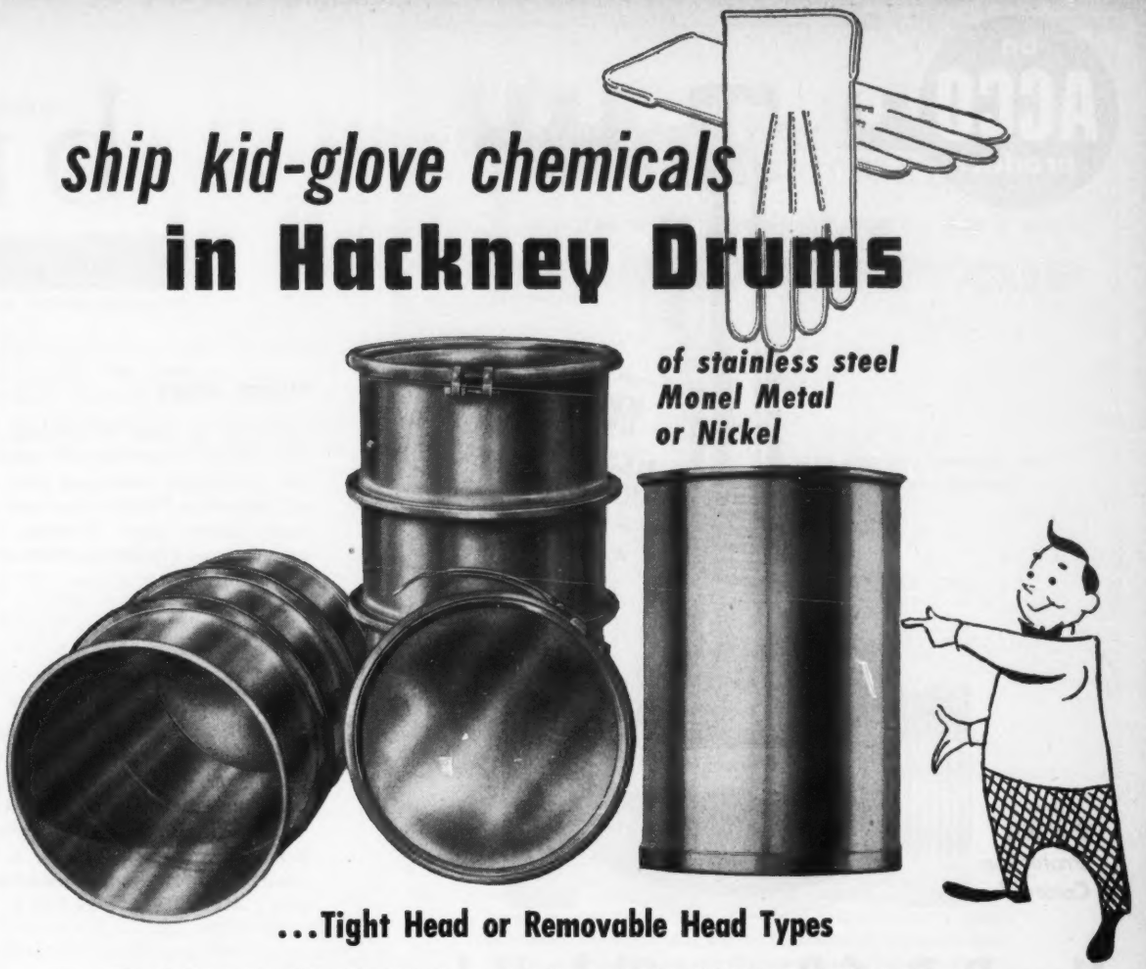
Top view of machine. Label magazines shown in foreground feed the glueing cylinder in center

(Jagenberg labelers are now manufactured and sold in the US by Pneumatic Scale Corp., Ltd., Dept. FP, 67 Newport Ave., Quincy, Mass. . . . or for more information check CP 8199 on handy form, opposite last page.)

ship kid-glove chemicals

in Hackney Drums

of stainless steel Monel Metal or Nickel



...Tight Head or Removable Head Types

Here's the returnable shipping container to protect your sensitive chemicals, oils, and food products against contamination during shipment or in storage. Tight head or removable head Hackney Drums are available in several types of stainless steel—or in Monel metal—or in nickel. Choose the metal that treats your product best—and be sure the high purity of your product is protected all the way to its destination.

Both open head and tight head models are ruggedly built for long life and low damage claims. Both have smooth, crack-free interiors that are easily kept spotlessly clean. Can be furnished as mixing containers without I-bars, cover or clamp ring if desired.

Write for specifications and details. Ask for the new Hackney Drum and Barrel Catalog which describes Hackney engineered containers for all solids and liquids.



PRESSED STEEL TANK COMPANY

Manufacturer of Hackney Products

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4550 W. Main St., Room 210, Kansas City 6, Mo. • 144 Wallace Ave., Downingtown, Pa.

Hackney MILWAUKEE

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 8200 opposite last page



"Reliable Protection & Control"

New R-P&C Bronze Globe Valve

—STAINLESS STEEL SEAT AND DISC (500 BRINELL)
—FULL-PLUG FOR CLOSER REGULATION, LONGER LIFE

R-P&C's new Fig. 427-DP bronze globe valve is recommended for steam, water, oil and gas service where control or regulation of flow is required. Its 500 Brinell stainless steel seat and disc resist wire-drawing—make it particularly suitable for continuous throttling and other severe applications.

• The Fig. 427-DP is packed with the quality features that users expect from R-P&C. For example, the union bonnet for added strength and convenience, and a disc and seat ring construction which permits regrinding without removing the valve from the line. The full-plug construction, with its exceptional wide seating surface, gives closer control, longer life.

• The Fig. 427-DP is rated for 300 lbs. Steam—1000 lbs. OWG in sizes ¼" to 2", and 600 OWG in sizes 2½" and 3". Also supplied as an angle valve. Precisely designed, it is a fitting addition to R-P&C's complete line of bronze valves—gates, globes, angles and checks, in pressure classes from 125 to 300 lbs. See your R-P&C Distributor or write for catalog.

ACCO

R-P&C Valve Division
AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

R-P&C valves

When inquiring check CP 8201 opposite last page

briefs

from contemporary publications

Indium alloys

Structures of alloys of indium, lead, and tin at room temperature are reported. X-ray and microscopic techniques were employed, and Brinell and Vickers hardness tests were made. Sixteen pages, 5 tables, 19 figures, 13 references. (*"Canadian Journal of Chemistry", March,* 1955, *page* 511.)

Superphosphate

This laboratory study of the effect of particle size on the ammoniation of superphosphate covers mixtures of screened phosphate, potassium chloride, and sand. In general, small particle size favors absorption of ammonia. Five pages, 4 tables, 6 figures, 4 references. (*"Agricultural and Food Chemistry", March,* 1955, *page* 218.)

Attention, young engineers

Advice to young engineers who want to get ahead deals with attitudes, ideas, reputation, and cooperation. Two pages. (*"Oil and Gas Journal," April,* 1955, *page* 120.)

Giving a technical talk

Replete with suggestions for getting engineering ideas across to audiences, this paper illustrates how to present written material as well. Three pages. (*"Power," April,* 1955, *page* 104.)

Analog computers

Industrial uses of analog computers cover servomechanisms, DC motors, and differential analyzers. Applications in all fields of engineering are listed. (*"Instruments and Automation," April,* 1955, *page* 594.)

Water properties

This survey of some thermodynamic and physical properties of water covers specific heats, thermal conductivities, viscosities, and Prandtl moduli. Extensive tables are included. (*"Combustion," April,* 1955, *page* 51.)

Acetic anhydride syntheses

From England come four commercial methods for synthesizing acetic anhydride from raw materials that have their origin in petroleum. Technical aspects of the processes are considered. Nine pages, one table, 3 figures, 10 references. (*"Industrial Chemist," April,* 1955, *page* 115.)

Divided-flow fittings

This study of pressure losses in divided-flow pipe fittings resulted in an equation in good agreement with observed data. Practical aspects of the problems are included. Seven pages, 11 figures, 17 references. (*"Heating Piping, and Air Conditioning," April,* 1955, *page* 141.)

Licking fly ash

This report shows how improved breeching design and a new fly ash collector have greatly increased boiler capacity, reduced steam costs, and halted a detrimental dust condition. Three pages, 2 figures. (*"Industry and Power," April,* 1955, *page* 46.)

Control of bacteria

Low-pressure steam is effectively used in killing spore-forming bacteria that clog air conditioning systems. (*"Southern Power and Industry," April,* 1955, *page* 66.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service for you . . .

Chlorine dioxide

This presentation of the properties of chlorine dioxide is supplemented with decomposition temperatures and rates of propogation of chlorine dioxide explosions. Decomposition pressure can be dissipated in well-designed equipment. Chlorine dioxide is not toxic in tolerable concentrations. Four pages. (*"Tappi," April,* 1955, *page* 199.)

Combustion control

British publication presents survey of methods for measuring oxygen and controlling combustion in the boiler plant. A plot shows the relation between oxygen, carbon dioxide, and excess air in the stack gases. (*"The Steam Engineer," March,* 1955, *page* 195.)

Titanium in cast iron

Titanium affects the following properties of cast iron: microstructure, strength, hardness, machinability, and resistance to corrosion, heat, and wear. Photomicrographs are included. Six pages, 8 tables, 9 figures. (*"Foundry," April,* 1955, *page* 118.)

Organizational plans

How to make an organizational plan work is discussed under headings of describing the job, functional operations and the human being, communications, and the use of committees. (*"Chemical Engineering Progress," April,* 1955, *page* 174.)

Welding titanium

Through fusion methods titanium can be welded without filler metal. This brief treatise covers tests, variables, pickling baths, and effects of argon and backup pressures. Four pages, 6 photographs. (*"Welding Engineer," April,* 1955, *page* 38.)

Refinery waste water

From England comes a digest of modern American practice that bears on treatment of waste water from refineries. Featured are removal of oily impurities, clarification of water. (*"Water," April,* 1955, *page* 106.)

Viscose rayon stabilizer

Suitably catalyzed, acrolein reacts with mixtures of formaldehyde and paraformaldehyde to form X-2, a stabilizer for viscose rayon. This paper deals with the structure of X-2 and the use of X-2 in the crosslinking of cellulose. X-2 cannot form detrimental chloramines. (*"American Dyestuff Reporter," April* 11, 1955, *page* 251.)

Salt manufacture

Manufacture of salt through application of modern chemical engineering techniques is described. Brine wells, aeration, chemical treatment, evaporation, dewatering of slurry, and graining are covered. Twelve pages. (*"Industrial and Engineering Chemistry," April,* 1955, *page* 672.)

Vacuum heat treating

This discussion deals with atmospheres, surface contaminants, batch furnaces, vacuum retorts, and mechanical and diffusion pumps. Attention is given to vacuum gages and bypass valves. Four pages, 3 figures, 6 references. (*"Steel," April* 11, 1955, *page* 108.)

Pulping of bagasse

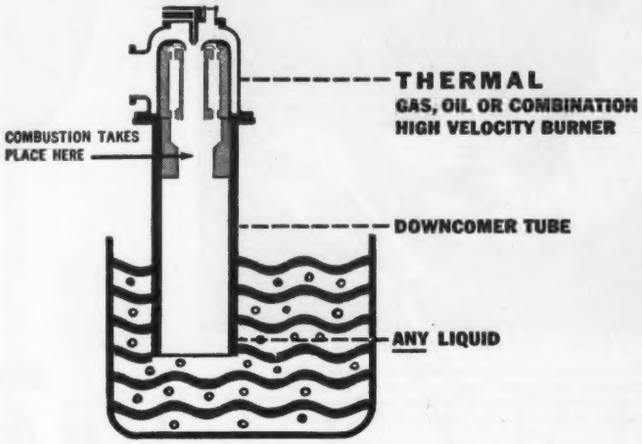
Alkaline pulping of bagasse for dissolving pulps and high-strength papers is outlined. The following points are considered: separation of pith and fiber, screening, pulping, polymerization, and physical strength. (*"Paper Industry," April,* 1955, *page* 52.)

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SUBMERGED COMBUSTION

In a form so simple it can be used with

ANY LIQUID HEATING PROCESS!



USE ANY THERMAL BURNER . . .

With heat release characteristics of over 10,000,000 BTU/-hr/cu ft readily feasible, extreme compactness is easily obtained. The THERMAL burner is completely separate from the liquid being heated and maintenance is therefore greatly simplified.

DOWNCOMER CONSTRUCTION . . .

Successful tube materials have been developed for all corrosive liquids as well as for heating liquids to as high as 2,500°F.

HIGH VELOCITY AIDS TRANSFER . . .

THERMAL burners develop exit velocities as high as 500 ft/sec. Additional turbulence obtained by forcing the products of combustion through the liquid promotes speedier, more uniform heat transfer.

OTHER THERMAL PRODUCTS & SERVICES — Gas, Oil & Combination Burners • Air Heaters • Combustion & Heat Transfer Equipment

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Thermal Research & Engineering Corp.

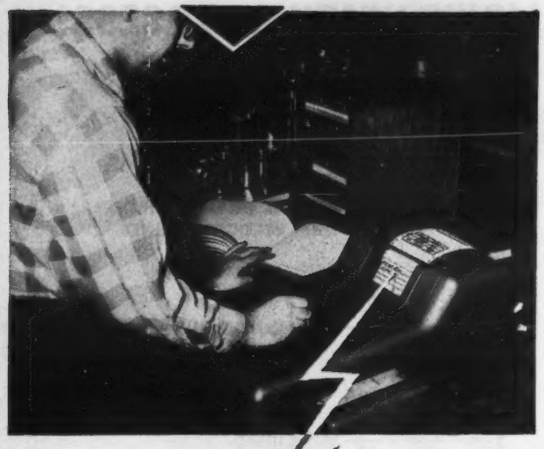
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REPRESENTATIVES IN PRINCIPAL CITIES

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problem: speed analysis reporting

solution: Instan-Form® COMMUNICATION SYSTEMS



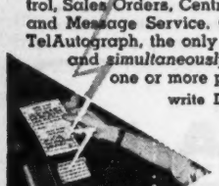
This TelAutograph® 'Instan-Form' transceiver in the Chemical Lab speeds quality analysis reports to 'Instan-Form' receivers in outlying departments of the 30-acre plant as the reports are being written!

Producers of roofing materials, chemicals and creosote oils, the Barrett Division of Allied Chemical & Dye Corporation, Chicago, must adhere to strict quality standards. Results of hourly analyses are telescribed *instantly* by the Chemical Lab to one or more production centers. An additional test is made of every rail tank car carrying Barrett products. No car can move until the Chemical Lab telescribes a test okay to the Traffic Supervisor. Speed of reporting keeps cars moving, reducing demurrage costs.

At Barrett, 'Instan-Form':

- **Instantly transmits results of tests to outlying departments**
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'Instan-Form' Communication Systems are also used for: Production Control, Centralized Accounting, Materials Control, Sales Orders, Centralized Filing, Transportation Control, and Message Service. Couldn't your company benefit with TelAutograph, the only communication system that *instantly* and *simultaneously* transmits handwritten messages to one or more points, near or far. For free literature, write Dept. CP-57.

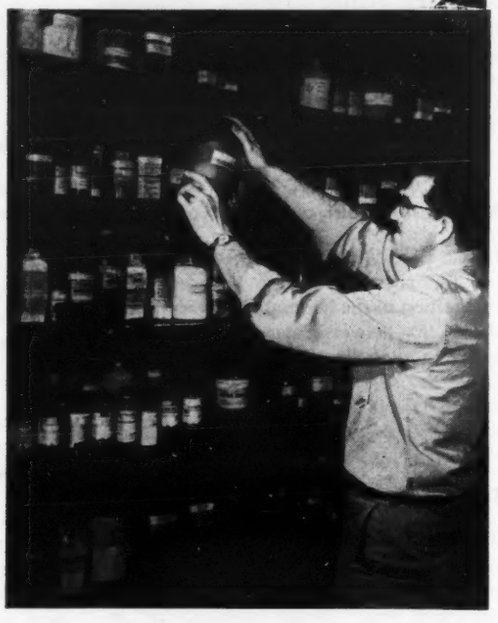


TelAutograph CORPORATION
16 West 61st St. • New York 23, N. Y.

When inquiring check CP 8203 opposite last page



Card catalog turns to face chemist or crib attendant so that . . .
. . . chemical can be located quickly despite the fact that 15,000 separate containers are on shelves



Dow chemists use library methods to find chemicals quickly

With 15,000 chemicals in a variety of containers, special storage conditions to be met, sharply differing rates of turnover . . . "storage engineering" provides an efficient answer

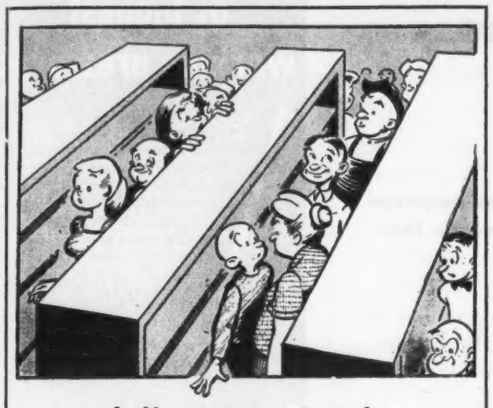
Dow's Britton laboratory in Midland, Mich. faces a storage problem similar, except in scale, to that in most chemical laboratories. In its two years of existence, this lab has built up a stock of 15,000 chemical compounds. Some of these are as simple as sulfuric acid — used every day. Some of these are products of hundreds of hours of work and research. They may be used years from now or may never be used at all. How does Britton laboratory keep track of this material? By means of "storage engineering."

Since a chemical lab without chemicals is pointless, planners started using "storage engineering" while the lab was still on paper. Lab personnel and purchasing agents made lists of what would need to be stored.

Most storage planning is easier than that needed for a chemical lab because predictability is better. Maintenance material, for example, can be broken down into convenient classes: nuts and bolts, pipe and tube, etc. But to think of storing all big bottles in one place and all small ones in another would be just as silly as it sounds.

Planning at Dow led to classing and storing chemicals by their rate of turnover. Much-used, "busy" chemicals were alloted storage aisles near regular lab supply crib. Here, ample spacing of steel shelves allowed large and small containers to be stored together. Little-used chemicals were given locked storage space on the top floor of the lab. Furthermore, this area was designed to be expandable to hold accumulated products of research.

Having reached this point, lab management was faced with a decision: Could this storage space be provided best by building storage units or by using "ready-made" facilities that might be available? Study showed that ready-made storage shelving was more economical — especially when storage procedure could be built around it rather than fabricating storage facilities to fit a preconceived theory.



shelf storage principles

—Keep aisles wide enough to do business—30" minimum, 36" for bulky objects

—Avoid dead-ends—it's faster to S-turn through aisles than to backtrack

—Provide plenty of light and prefer to control light with uniformly located switches, not pull-chains

—Size shelves for stock to be stored

—Store high-turnover items near the counter, so far as possible

—Devise a labeling and numbering system that will work ten years from today . . . as well as now

Storage specialists, in fact, have worked out industry-wide standards based on past experience. Examples of these (listed here) can be seen to apply to chemical storage as well as many other storage jobs.

With the idea for physical storage facilities crystallized, attention was turned to a system for locating and dispensing chemicals. Practical approach to this problem was that used by a library. Each of the 15,000 chemicals was given a 3 x 5 card. Housed in a swiveling eight-drawer stand, these cards are filed alphabetically by chemical name and show (by number) exactly where each is stored.

By locating this card catalog on the crib counter, it can be used by crib attendants or chemists handily. And to further economize on crib attendant's time, there is a self-service "super-market" for chemists.

Problem of storing and dispensing equipment was solved along lines nearly identical with these. Prepunched, pre-formed steel shelving with wooden partitions served as well for equipment as it had for chemicals. Heavy, bulky objects are kept near floor.

(Storage consultation and facilities were provided by Pressed Steel Div., Republic Steel Corp., Dept. CP, 1405 Republic Bldg., Cleveland 1, Ohio . . . or for more information check CP 8204 opp. last page.)

MANTLES FOR
EVERY PURPOSE



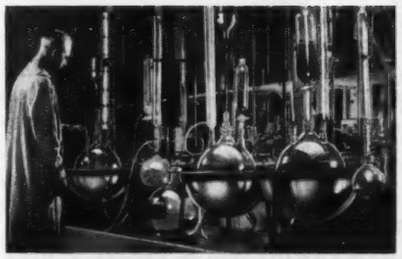
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Glas-Col Heating Mantles in many sizes, shapes, and types, are available in standard and custom-made models, in glass or quartz fabric construction, including a new line of metal-housed units. These safe fabrics protect the glass wall from thermal strain . . . reduce fire hazard. Temperatures are accurately controlled by means of a variable transformer up to 650 C. Mantles up to 72-liter capacity for glass flasks are available. Write Glas-Col, today, for information on their complete line of electric heating mantles and for sound counsel in helping you solve your problems for the safe heating of inflammable liquids.

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ELECTRIC HEATING MANTLES
SPECIALISTS IN LABORATORY AND PILOT PLANT HEATING PROBLEMS

When inquiring check CP 8205 opposite last page

New Quick Lab Mix!



BROOKFIELD

Counter-Rotating Blade Action

Gives You New Speed, Ease, Efficiency

The ultimate in laboratory mixing effectiveness! Brookfield mixing action — shown above — provides an *annular* flow pattern . . . sweeping both heavy and light particles into the high shear zone, without causing usual vortex and rise in liquid level. This means new *speed and efficiency!*

An entirely new design concept, the shafts can be removed for cleaning or sterilization in seconds. It is easily portable, and mixes any fluid material in any container.

Get all the facts. Phone, wire, write, or clip and mail the handy coupon below.

Do it today!

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When inquiring check CP 8206 opposite last page

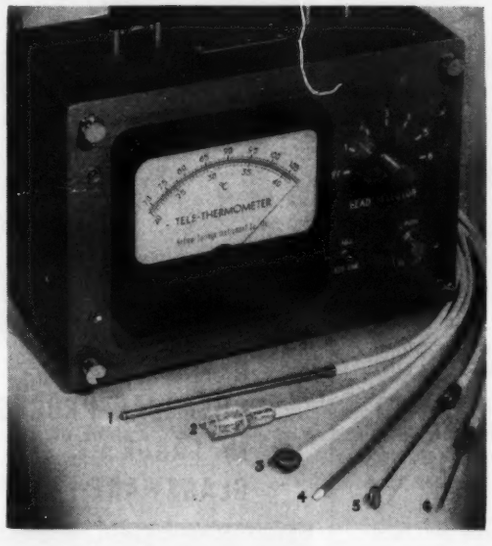
Versatility of lab thermometer increased with six probes for special uses

probes are small, have fast response times, can be used for remote thermometry

Uses: For measurement of air temperatures in test rooms, temperatures of liquids and flat surfaces, remote thermometry as in nuclear work or under hazardous conditions.

Features: Probes have fast response times and are small in size. Six probe designs cover many uses and require only one indicator.

Description: Probes to be used with manufacturer's indicator are shown in photograph and numbered:



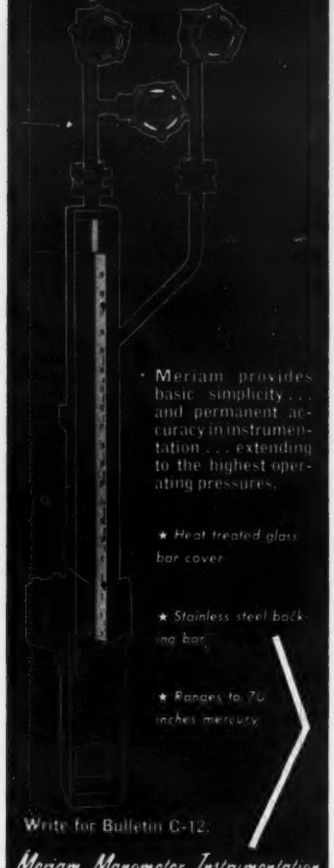
1) Stainless-steel probe, 2) Air-temperature probe, 3) Flat-surface probe, 4) Flexible immersion probe, 5) Oral probe, 6) Hypodermic-style probe.

Typical response times are: stainless-steel and oral probes, four sec; flexible immersion probe, 35 sec; hypodermic-style probe, three sec. Response times are determined by transferring probe from 68°F water bath to another at 108°F and noting time required to indicate within 1% (0.4°F) of final reading.

(Probes are product of Yellow Springs Instrument Company, Inc., Dept. CP, P.O. Box 106, Yellow Springs, Ohio . . . or for more information check CP 8207 on handy form opposite last page.)

UNMATCHED ACCURACY
at highest working pressures

At pressures up to 2000 psi, this Meriam Manometer provides critically accurate flow or differential pressure measurement. Constructed of solid bar stock steel, all parts are precision fitted, hand lapped. Each unit is cold hydraulic tested to 5000 psi.



Meriam provides basic simplicity . . . and permanent accuracy in instrumentation . . . extending to the highest operating pressures.

★ Heat treated glass bar cover

★ Stainless steel backing bar

★ Ranges to 70 inches mercury

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Meriam Manometer Instrumentation
. . . for pressures, vacuums, flows, liquid levels.

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10920 Madison Ave. • Cleveland 2, Ohio

When inquiring check CP 8208 opposite last page

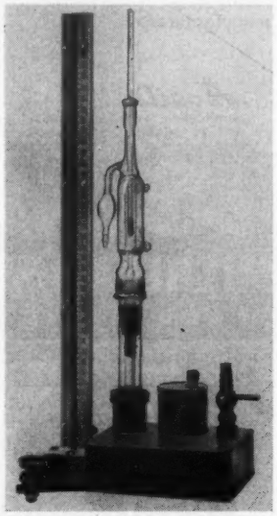
Bubble-bursting pressure gives surface tension . . .

requires only 0.02-ml sample, tells surface tension with accuracy to 0.1%

Uses: Measures surface tension for Parachor and Eotvos constant determinations on soaps, detergents, inks, oils, chemicals.

Features: Instrument requires only 0.02-ml sample. Closed chamber construction permits surface tension to be measured in any desired gas. Accuracy is 0.1%. Measurement is rapid.

Description:



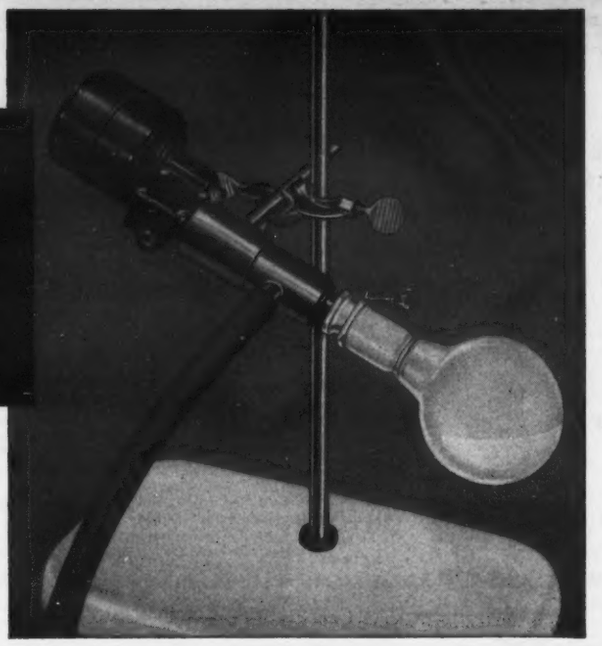
Unit measures maximum pressure attainable inside a small bubble formed over an orifice. Correction for hydrostatic head is negligible. Measurement is inside small jacketed chamber for temperature control. Chamber also acts as trap for gases or vapors against which surface tension is measured.

Piston applies gas pressure inside the bubble as manometer measures gas pressure required to inject bubble into liquid. Bursting of bubble, heard through stethoscope, indicates measurement. Manometer reading is proportional to surface tension.

(Surface tensiometer is product of National Instrument Laboratories, Inc., Dept. CP, 6108 Rhode Island Ave., Riverdale, Md. . . . or for more information check CP 8209 on handy form opposite last page.)



for rapid evaporation of solvents of low volatility



Use **THE**

RINCO ROTATING VACUUM-TYPE EVAPORATOR

(Patent Applied For)

● For speeding up routine evaporations. Handles volumes from 1 c.c. to 1000 c.c. Principle utilized — rotation of flask spreads out thin film over large area (diameter of flask) subjected to negative pressure. "Bumping" eliminated. Use of glass beads unnecessary. Rate of evaporation increased 4 to 5 times, depending on solvent used. Particularly advantageous with such solvents as water, dimethylformamide, etc. 30 ml. of water at 20° C will be evaporated in 30 minutes or less. Very useful with heat sensitive compounds and biological extracts since no temperature increases are necessary. Evaporator will, of course, operate satisfactorily at higher evaporation rates with increased temperature, when sample characteristics permit application of heat.

Evaporator consists essentially of a stainless steel shaft with a machined Standard Taper 19/38 joint at lower end. Shaft rotates on oilite bronze bearings within stainless steel housing having Standard Taper 12/30 take-off leading to vacuum pump or aspirator. Vacuum pump and trap are recommended for best results, but can be used with aspirator. Flask attached to Standard Taper joint at lower end of shaft rotates at approximately 60 r.p.m. by means of special motor. Standard Taper 19/38 joint accommodates smaller capacity flasks, i.e., 50 ml. H-63620 Reducing Adapters, Pyrex Brand Glass, permit use of larger flasks having Standard Taper 24/40, 29/42, etc. Entire apparatus can be easily disassembled for cleaning.

Can be adapted to single or multiple units.

Note: Support stand, clamp and glassware are accessories and may be ordered separately.

H-21655 — Rinco Rotating Vacuum-type evaporator complete with motor and cord for use on 115V 60C, A.C. . . . **$96.50**

HARSHAW SCIENTIFIC
DIVISION OF THE HARSHAW CHEMICAL CO.
CLEVELAND 6, OHIO

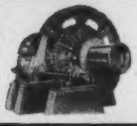
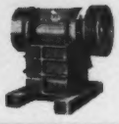
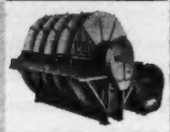
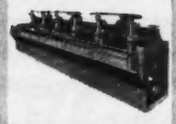
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When inquiring check CP 8210 opposite last page

DENVER PROCESS EQUIPMENT

		SIZES	
DENVER (patented) SUPER AGITATORS and MIXERS		3'x 3' to 20'x 20'	Patented standpipe around propeller sha assures positive agitation and circulation Patented wearing plate prevents sand-up e shut-down. Heavy duty as well as acid proof construction is available in both open type, air lift and Super Agitator models Please write for Bulletin No. A2-B4.
DENVER Steel-Head BALL MILL		3'x 2' to 6'x 12'	A Denver Steel-Head Ball Mill will suit you particular need. Five types of discharge trun nions. All-steel construction. Low initial cos due to quantity production. Quick delivery Laboratory and pilot plant mills also avail able. Please write for Bulletin No. B2-B13
DENVER CLASSIFERS		18" to 60" Wide Suitable Length	Denver Rake Type Classifiers are available in sizes from 1'-6" x 14'-8" to 8' x 21'-8" Denver Spiral Classifiers range in size from 6" x 5'-8" to 60" x 33'-4". Denver Hydr Classifiers are available in diameters from 6' to 55'. All are designed to efficiently separate fine particles in specific applica tions. Please write for bulletin No. C5C-B
DENVER Forced-Feed JAW CRUSHER		2¼"x 3½" to 32"x 40"	Cast Steel Frame, manganese jaw and cheek plates. Large diameter shafts reduce shaft deflection and thus increase life of heavy duty, oversize roller bearings in bumper Setting easily controlled. Please write for Bulletin No. C12-B12.
DENVER Wet Reagent FEEDER		0 cc to 2000 cc	Accurately meters minute quantities of liquid from 0 cc to 2000 cc per minute. Float valve in tank permits connection of feeder to bulk storage device. Handwheel adjustment to control amount of liquid is simple and ac curate. Used in multiples for higher capac ities. Please write for Bulletin No. F6-B9
DENVER Disc FILTER		1 Disc, 2' to 8 Disc, 6'	Special, patented design of segments in Denver Disc Filters use both gravity and vacuum to give a drier filter cake. Drainage is complete and positive, with no blow-back Simple, low-cost, dependable construction Quick delivery. Also Drum and Pan Filters Please write for Bulletin No. F9-B2.
DENVER "Sub-A" FLOTATION		Laboratory and Commercial	Flotation is the selective separation of par ticles from each other in a liquid pulp by means of air bubbles. More large plants are installing Denver "Sub-A's" for their entire flotation job, because they give maximum recovery at a low cost per ton. Dependable low-cost, simplified continuous operation Please write for Bulletin No. F10-B81.
DENVER Wilfley Concentration TABLES		5 to 150 T/24 Hrs.	A mechanically operated, longitudinally re ciprocating table consisting of a deck hav ing a plane surface partly riffled and a tilt ing device. It separates materials into bands and handles the coarsest sands with excel lent results. Ideal for separation of groups of particles having a similar range of spe cific gravities. Write for Bulletin No. T1-B3
DENVER LABORATORY EQUIPMENT		Batch or Continuous	Batch and continuous test models of Crushers Screens, Ball Mills, Pulverizers, Rod Mills Classifiers, Agitators and Mixers, Pulp Dis tributors, Feeders, Flotation Machines, Pumps Thickeners, Filters, Dryers, Tables, Samplers Results obtained on Denver Laboratory Equip ment can be duplicated by commercial ma chines. Please write for Bulletin No. LG3-B1
DENVER Standard DRYERS		2'x 15' to 5'x 40' and larger	Available in several types: Direct Heat, In direct Heat, and Steam Tube. Let DECO En gineers solve your drying problem. No dryer problem too small or too large. Please write for Bulletin No. D4-B2.

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DECO — DENVER EQUIPMENT COMPANY

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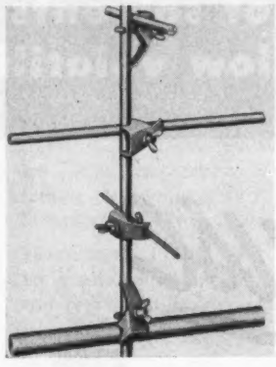
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When inquiring check CP 8211 opposite last page

LABORATORY

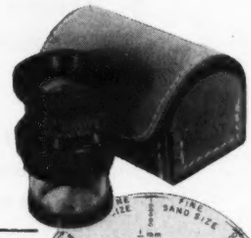
Stainless steel clamps resist corrosion

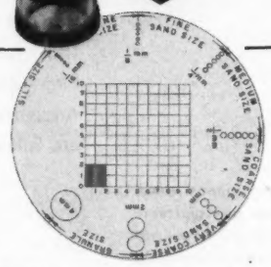
Used for clamping laboratory apparatus and building equipment setups, clamp is heavy-gage, cor-



rosion-resistant stainless steel. Rods to 1½" diameter can be clamped in adjustable hook.

(Unbrako clamps are product of Labline, Inc., Dept. CP, 3070-82 W. Grand Ave., Chicago 22, Ill. . . . or for more information check CP 8212 opposite last page.)





Particle counter allows analysis of specimens on the spot. Etched glass reticle is superimposed directly on specimen. Specimen and reticle are magnified six times. Grid scale in center allows count per sq mm or sq 0.2 mm.

(Sand-measuring magnifier is product of Edmund Scientific Corp., Dept. CP, 145 E. Gloucester Pike, Barrington 3, N. J. Check CP 8213 opp. last page.)

SMOOTH—VIBRATIONLESS PROPELLERS

for MIXING, STIRRING, AERATING, PUMPING, etc.

Manufactured by an exclusive process, MICHIGAN propellers are perfectly balanced to avoid whip and strain on shafts. And because of their superior functioning are now standard parts of the products of many leading equipment manufacturers.



Available for special application and replacement, as well as original equipment, in a wide variety of metals and in sizes up to 60". Write for latest data folder.

MODEL GDA - MIXER BY INTERNATIONAL ENGINEERING DAYTON, OHIO

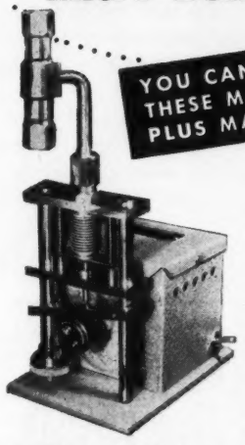
MICHIGAN WHEEL CO.

GRAND RAPIDS 3, MICH.

When inquiring check CP 8214 opposite last page

With the CORSON-CERVENY Micro-Bellows Pump

YOU CAN HANDLE ALL THESE MATERIALS — PLUS MANY MORE:



Acetaldehyde
Acetic Acid
Acetone
Aniline
Benzaldehyde
Benzene
Ethyl Benzene
Carbon Disulfide
Carbon Tetrachloride
Cyclohexane
Dioxane
Ethanol
Formalin
Isopropyl Alcohol
Methanol
Pyridine
Toluene
Water

We have a booklet that gives all construction, operation and application details of the Corson-Cerveny Micro-Bellows Pump. Write for your copy.

RESEARCH APPLIANCE COMPANY

143 Cemetery Lane, Pittsburgh 9, Pa.

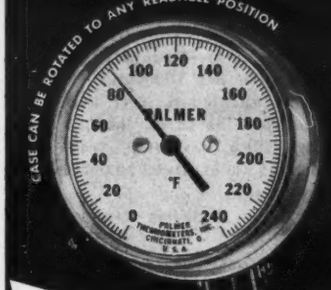
When inquiring check CP 8215 opposite last page

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presents

an outstanding improvement in

DIAL THERMOMETERS



Direct Drive

Mercury Actuated

external calibration

Full 3½" Dial Face

- No Sector
- No Pinion
- No Linkage
- Constant Accuracy
- Easy Readability

WRITE FOR BULLETIN 350

PALMER

THERMOMETERS, INC.

Norwood Ave., Cincinnati 12, Ohio

Mfrs. of Industrial Laboratory Recording and Dial Thermometers

When inquiring check CP 8216 opposite last page

From 2 cc syringe to 20 l flask electrically powered brush speeds washing job . . .

interchangeable brushes are specifically designed for each job, stand temps to 160°F

Uses: Washing of standard sizes and shapes of lab glassware rapidly.

Features: Interchangeable brushes, capable of continuous use at 160°F, are made for specific jobs.

Description: Standard and special brushes are available for most glasses, test tubes, syringes, Erlenmeyer flasks, Petridishes, etc. Powered brushes use crimped nylon bristles on aluminum stems. Bristles are held in place with steel wires. Tips of the brushes are replaceable — saving replacement costs for entire brushes. Taper-lock shanks permit brush change quickly and without tools. Bristles can be used at 160°F without loss of resilience.



For glassware larger than the sink, a flexible brush attachment is used

Splashproof, waterproof motors drive brushes. Motors can be explosion-proof also, if needed.

Minimum space requirement in the sink is 12 x 12 x 10" deep. Installation is simple. Brush spindles protrude from water-tight gear reducers. All gears run in a bath of oil. Flexible shaft attachment permits washing glassware too large for tub.

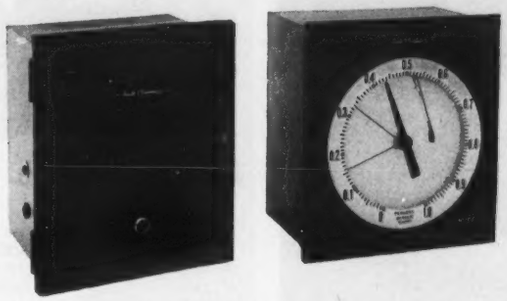
Portable models 12 x 12 x 10" are also available. These can be placed in any sink large enough.

(Lab washers are built by Speedy Electric Glass Washer Co., Inc., Dept. CP., 1928 W. Columbia Ave., Chicago 26, Ill. . . . or for more information check CP 8217 on handy form opposite last page.)

NEW SAVINGS in your operations

with

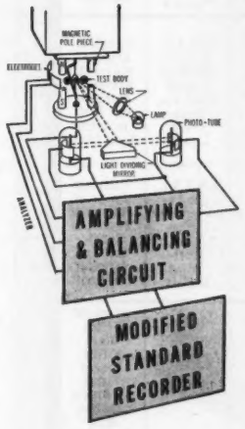
Arnold O. Beckman OXYGEN ANALYZERS



Pictured is the Model G2 Recording Analyzer—finest for precise oxygen measurement.

ON OPERATIONS LIKE THESE . . . MAKE SAVINGS LIKE THESE

PROCESSING AIR LIQUIFRACTION AND PRODUCTION OF HIGH PURITY GASES	*Better product quality with minimum oxygen or air contamination*
SAFETY PRODUCTION OF HYDROGEN, ACETYLENE, ETC.	*Control explosive atmospheres, reduce fire risks, minimize plant and personnel hazards*
PRODUCT PROTECTION RESIN KETTLES, COLOR PIGMENTS, PRODUCT STORAGE, ETC.	*Reduce oxidation, maintain product standards with controlled purge systems*



Unique Operating Principle

The various applications highlighted above are only a few of the many ways Arnold O. Beckman Oxygen Analyzers—industry's great new profit builders—are being used by progressive operators to boost profits, cut costs.

These are the *only* oxygen analyzers that *continuously* measure process streams by an advanced magnetic principle that provides *direct physical measurement of the oxygen itself*—not of some secondary relationship.

Heart of the unit, as illustrated, is a dumbbell-shaped test body suspended in a magnetic field. Sample gas surrounding this test body causes it to rotate in the field, depending upon the oxygen content of the gas. The movement of a light beam, reflected by a small mirror on the test body, is measured by simple electronic circuits . . . and the result indicated directly on a conventional recorder or indicator. It's simple, positive, accurate!

No chemicals—filaments—catalysts cams—complicated mechanical parts!

***Send for Helpful Free Literature** which describes this unique operating principle in detail—explains its many advantages and applications. When writing, outline your particular operations—we'll gladly supply specific information.*

Ask For Data File 15H-75

FEATURES OF THE G2

Many ranges: Full scale ranges 0-0.1%, 0-0.5%, 0-1% O_2 and others for low O_2 concentrations. Ranges 90-100%, 95-100% O_2, etc., for high O_2 concentrations.

Multi-Ranges: Any instrument may be supplied with two or more ranges.

Note: For ranges wider than 0-5% O_2, ask about the Model F3 Analyzer.

Arnold O. Beckman INC.

Instruments for Science and Industry

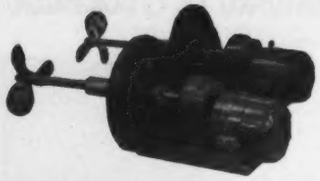
1020 MISSION STREET

SOUTH PASADENA CALIFORNIA

When inquiring check CP 8218 opposite last page



if MIXING is the problem . . .



ALSOP has the answer

For over 30 years, processing men have relied on the consistent high standard of Alsop Mixers — and the technical service of Alsop engineers to help solve their mixing problems.

If your process involves mixing, blending, suspending or dissolving, it will pay you to invest in an Alsop Mixer. Available in portable or stationary models in a wide range of powers, speeds and propeller combinations for efficient, economical operation.

Write for complete information giving details of liquids and quantities to be handled.

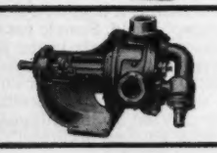
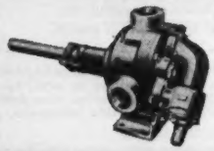
ALSOP ENGINEERING CORPORATION
1007 Alsop Square, Milldale, Conn.

It pays to buy - ALSOP
FILTERS - MIXERS - PUMPS & TANKS

When inquiring check CP 8219 opposite last page

PICK THE RIGHT VIKING PUMP for your needs

it's easy with this Simple Chart

	Catalog	Service	Capacity	Maximum Pressure	Features
	Ask for Section Bcc	General Purpose Pumps for Handling Liquids Ranging from Fuel Oil to Molasses	½ to 1050 G.P.M.	50 P.S.I. Non-Lubricating Liquids 100 P.S.I. Lubricating Liquids	Complete Range of Materials. Packed or Mechanical Seal. Jacketed Equipment.
	Ask for Section Ccc	Heavy Duty Pumps Handle Both Thin and Very Viscous Liquids	10 to 300 G.P.M.	100 P.S.I. Non-Lubricating Liquids 200 P.S.I. Lubricating Liquids	Complete Range of Materials. Packed or Mechanical Seal Jacketed Equipment.
	Ask for Section Dcc	Underwriters Pumps Handle All Types of Clean Hazardous Liquids	5 to 300 G.P.M.	50 P.S.I.	Standard Fitted Steel Fitted Bronze Fitted All Bronze Construction. Packed or Mechanical Seal.

Your Viking district office or distributor will promptly furnish complete information on these or many other Viking rotary pumps *to fit your needs.* Send for any of the above catalogs or check with your Viking distributor.

THE ORIGINAL "GEAR-WITHIN-A-GEAR" ROTARY PUMP

VIKING PUMP CO. Cedar Falls, Iowa

When inquiring check CP 8220 opposite last page

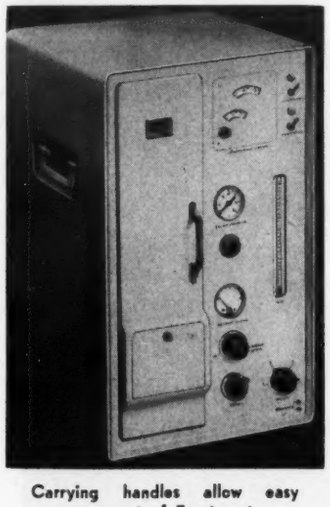
LABORATORY

Analyzes mixtures of gases or volatile liquids, using one mg

Uses: Routine analysis of gases and low-boiling liquids; separation of unknown components from mixture for qualitative analysis by infrared or mass spectroscopy.

Features: Sampling techniques and calculations are simple. Analysis requires ½ to five minutes per component.

Description: Instrument uses fractional separation of vapors by partition columns. Two four-foot



Carrying handles allow easy movement of Fractometer

folded columns may be used interchangeably or in tandem. Thermistor-style conductivity cell is detector. Partition columns are mounted in insulated chamber which can be held at temperatures between approximately 20 and 150°C.

As little as one mg of sample per analysis is required. Mixtures having boiling points to 250°C may be analyzed. Accuracy of determining trace components is usually independent of concentration or nature of others components present.

(Vapor Fractometer is product of The Perkin-Elmer Corporation, Dept. CP, 870 Main Ave., Norwalk, Conn. Check CP 8221 opposite last page.)

GRAPHIC VISUAL CONTROL



THE BOARDMASTER SYSTEM

★ Graphic Picture of Your Operations—Spotlighted by Color
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★ Simple and Flexible—Easily Adapted to Your Operations
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GRAPHIC SYSTEMS, 55 W. 42nd St., New York 36

When inquiring check CP 8222 opposite last page



Single-Point pH Recorder (Strip Chart Assemblies also available)

CAMBRIDGE pH INDICATORS and RECORDERS

Labor saving — profit producing!

In addition to portable pH Meters, Cambridge makes line-operated Direct Reading pH Indicators and Recorders for permanent installation. They are accurate, stable and assure continuous and trouble-free performance. Either the Recorder, Indicator or both, may be located at any reasonable distance from one or several sampling points. The Glass Electrodes are placed in vapor-tight housings of clog-free sampling chambers.

Send for Bulletin No. 910 T

CAMBRIDGE pH EQUIPMENT

CAMBRIDGE INSTRUMENT CO., INC.
3706 Grand Central Terminal, New York 17

PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

When inquiring check CP 8223 opposite last page

Pump pure water from carboys without contamination of contents



Bottle pump cleans make-up air before it enters container

Uses: Air filter in bottle pump protects contents of carboys and similar containers from contamination during storage and removal.

Features: Unit removes bacteria, particles in air small as 0.2μ, absorbs organic vapors, alkali and acid gases.

Description: Make-up air forced into container passes through filter and is cleaned before contact with contents. Distilled water remains pure. Bacteria are prevented from entering container. Carbon dioxide to concentrations of about 500 ppm are removed. Approximately 1000 gallons can be pumped before replacement of filter element.

(Barnstead bottle pump is product of Barnstead Still & Sterilizer Co., Dept. CP, 2 Lanesville Terrace, Forest Hills, Boston 31, Mass. . . . or for more information check CP 8224 on handy form opposite last page.)



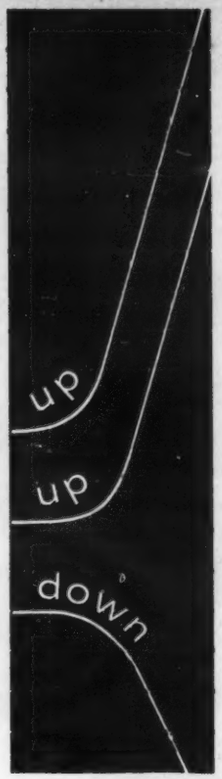
Looking for something?

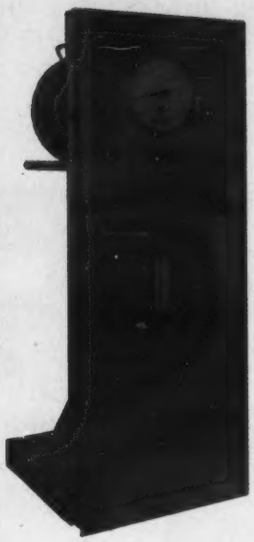
Laboratory reagents, specialties, equipment are all listed in CHEMICAL PROCESSING's Product Directory. See pages 185 to 188.

throughput up

quality up

costs down





process refractometer

(Type 38-201)

For monitoring or control of fractionating towers and stream-blending operations. Automatic control can be established through completion of composition-actuated feedback loop . . . or information can be telemetered to pen recorders in the refinery control room. SEND FOR BULLETIN CEC 1839-X6.

Here are the first "Consolidated-Phillips" *continuous* process analyzers . . . units which provide analytical data while it's valid, *before* variables have changed. With these two instruments on stream, product quality and production go up . . . costs go down. You can install and maintain them for less, on an hourly basis, than a laboratory technician's salary. They need no elaborate facilities, can operate out-of-doors, are completely explosion-proof.

Consolidated-Phillips process analyzers have been proving their ability . . . and dependability . . . under actual plant conditions for several years. Originally designed and formerly manufactured by Phillips Petroleum Company, they are now backed by Consolidated Engineering's nationwide service organization . . . assurance of interruption-free operation for years to come.



infrared analyzer

(Type 38-101)

Handles up to five streams at a rate of 5 analyses per hour per stream, i.e., 12-minute cycle period. Increases fractionator capacity by holding product composition steady and minimizing operational fluctuations. Eliminates the time lag between sampling and laboratory batch analysis. SEND FOR BULLETIN CEC 1840-X6.

Whether your process instrumentation needs are for a single unit or a complete analysis-and-control system, you'll find it will pay to talk to a CEC Field Engineer. Write us today.

Consolidated Engineering

Corporation

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When inquiring check CP 8225 opposite last page

HOW MANY ALKYD PLANTS MAKE AN EXPERT?



For over fifteen years I★P★E has been providing complete alkyd resin installations to the world's leading chemical manufacturers. From Boston to San Francisco, from Capetown (Africa!) to Kalamazoo, I★P★E units are designed for Dowtherm, electricity, gas or oil heat, and are constructed in all types of stainless steel.

Like all I★P★E process plants, these are designed, engineered, constructed and installed by I★P★E. Other I★P★E specialties include plants for Fats and Oils... Fatty Alcohols...Resins...Soaps and Detergents... Fermentation Products...Pharmaceuticals... Medium Organic Chemicals...Esters...and many others.

For further information, write the Process Plants Division today.

INDUSTRIAL PROCESS ENGINEERS

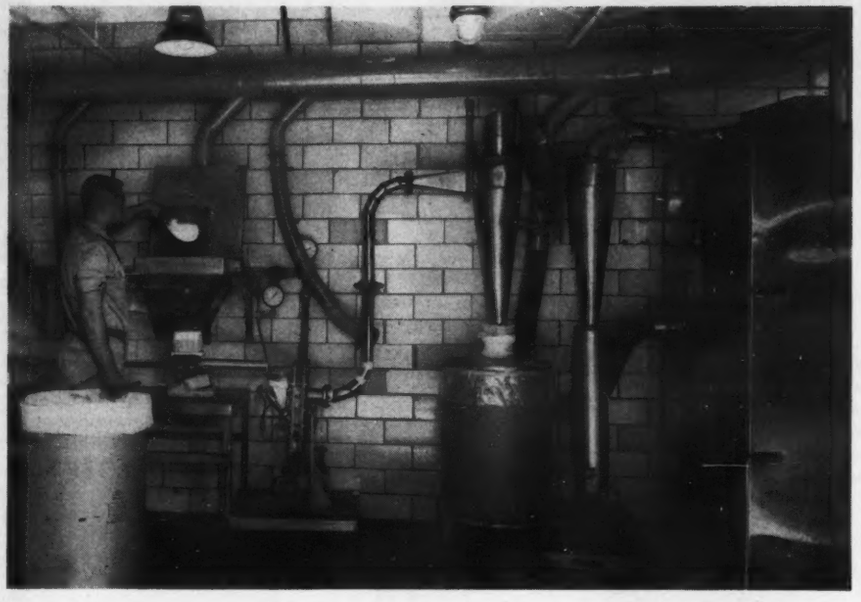
10 LISTER AVE., NEWARK 5, N. J.

I.P.E

Engineers, Designers, Fabricators . . . Process Plants and Equipment.

When inquiring check CP 8226 opposite last page

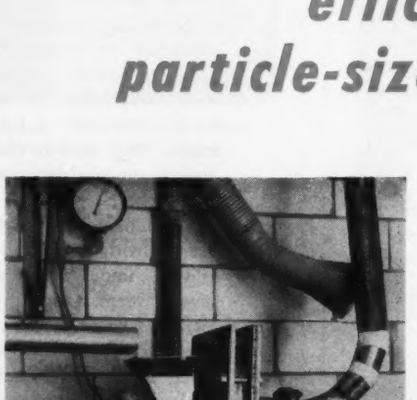
processing equipment



Operator scoops sulfa into feed hopper. Cyclones collect product, fines pass to nylon bags in cabinet (right)

Abbott Labs use fluid energy mill for

efficient particle-size reduction



Fluid energy reduction mill is made of stainless steel. Polished surfaces require no gaskets, are easy to clean

One pass brings material down to 5-10 micron range

Problem: Sulfa drugs at Abbott Laboratories, North Chicago, Ill., had to be reduced to 5-10 microns for effective utilization in ointments, suspensions, and company's branded Aerolater inhaler. High product purity had to be maintained.

Solution: A stainless steel fluid energy mill was installed about two years ago. Built to Abbott's specifications, the mill consists of ducts in an oval machined head. Two jets are built into outward surface of lower half, to disrupt suspension layer and to maintain forward movement. Fluid stream and fine particles are withdrawn from inner portion of duct with flow reversal, while coarser particles are thrown outward until reduced to desired size.

Adjustment forparticle size can be made by changing feed-to-plate-distance.

Mill uses 80-100 cu ft air/min @ 100 psig. A small amount is used to feed material to mill. A vibrating trough introduces material to hopper above air stream. Product is collected in two cyclones, fines passing to two woven nylon bags in a sealed unit. Recovery is almost 100%, on dry basis.

Results: Fluid energy mill performs efficiently and quickly. In one pass, 12 to 40 pounds/hr of product is reduced to desired particle size. Unit has required practically no maintenance.

Purity is easily maintained as cleanout is easy, efficient. Salt is passed through unit to clean it out. For major cleaning and inspection, flange of unit is removed and mill washed with water. No gaskets are required as unit has polished surfaces.

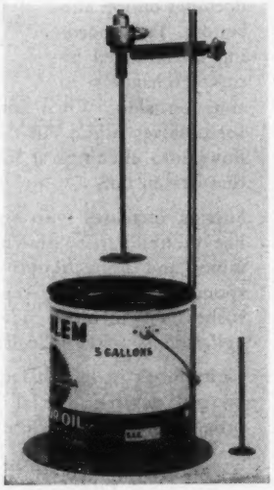
(Fluid energy jet mill, formerly a product of C. H. Wheeler Mfg. Co., is now being manufactured by Fluid Energy Processing & Equipment Co., Dept. CP, Richmond & Norris St., Philadelphia 25, Pa. . . . or check CP 8227 on handy form opposite last page.)

Portable mixer suited for small jobs

Uses: For laboratory and small mixing jobs. Handles liquids, dispersions, and slurries.

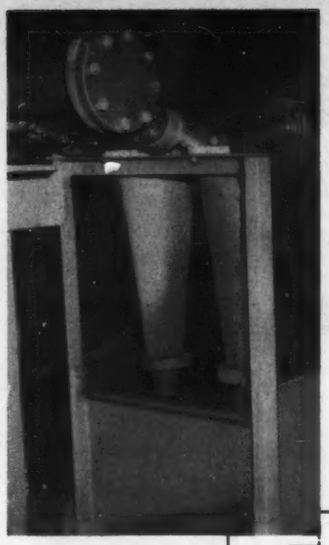
Features: Portable mixer has stirrer constructed of stainless steel. Air motor provides variable speeds for mixing.

Description: Mixer consists of self-supporting base, stand, motor, and stirrer. Unit weighs 20 lb and measures 15 x 15 x 34" high. Stirrer attaches to motor by sleeve coupling. Height is adjustable. Air motor (1/3 hp at 6000 rpm and 80-psi air pressure) will idle at 100 rpm. Patented stirrer design provides either mixing or homogenizing action, depending upon speed.



Portable mixer has adjustable-speed air motor, comes with two stirrers

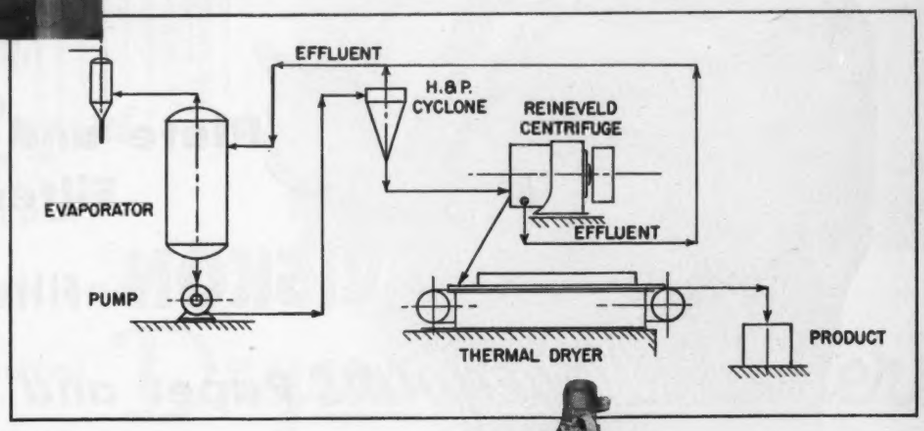
(Type-L Mixer is product of Conn and Company, Dept. CP, 11 South Marion Street, Warren, Pa. . . . or check CP 8228 on handy form opposite last page.)

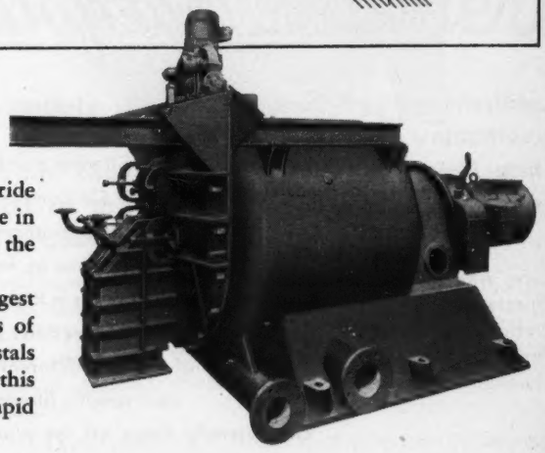


HEYL & PATTERSON can help you with your Liquid-Solid Separation problems

In a large chemical plant Heyl & Patterson Cyclones are currently used to classify a caustic slurry of sodium chloride at 200 mesh.

Slurry from a horizontal tube steam evaporator is fed to 8" H & P Cyclones. The Cyclone overflow, containing minus 200 mesh material is returned to the evaporator for further crystal growth. The underflow, containing plus 200 mesh material, passes to the next processing stage, using the Reineveld Centrifuge to dry the crystals.



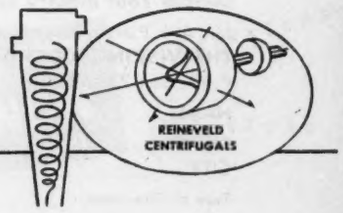


In the Reineveld processing method the sodium chloride slurry is fed into the machine rapidly, creating turbulence in the rotating drum. As the speed of the liquid approaches the speed of the drum, the turbulence is lessened.

During this period Centrifugal Force deposits the largest crystals against the screen cloth; then successive layers of crystals of smaller particle size, until the very finest crystals are deposited last on the crystal bed. The formation of this superior filter bed results in lower effluent losses and rapid liquid drainage.

Heyl & Patterson INC.

55 FORT PITT BLVD. • PITTSBURGH 22, PA.



When inquiring check CP 8229 opposite last page



"In Our Plate and Frame Filter Press

VISKON® Filter Fabric

Outperforms Paper and Cloth!"

— Mr. Napoleon Abraham
Ray Vegetable Oil Co.
Moultrie, Georgia

Filtering edible oils is a challenge to perfection! In this instance, the Ray Vegetable Oil Company met its challenge with VISKON nonwoven fabric. In the words of Mr. Abraham, VISKON outperformed both paper and woven cloth—and cut downtime by more than 50% . . . This was possible because VISKON has incredible wet strength; has a higher flow rate and achieves greater filtrate clarity . . . If you have a plate and frame filter press, check for yourself and get complete facts on VISKON. Learn of the 400 different cotton and synthetic fabrics that can be tailored to your own specific filtering need. Discover why VISKON lasts longer, why the filter cake literally drops off the plate! Your letter of inquiry will bring you this information so vital to your improved filtering operation.

Use This Handy Coupon, or
Dictate Your Inquiry Letter To:
Mr. A. I. Pierce, Filter Media Engineer
THE VISKING CORPORATION
P. O. Box 72★★North Little Rock, Arkansas

NAME_____
ADDRESS_____
CITY_____ ZONE____ STATE_____
Type of Filter Press:_____

VISKON®
nonwoven fabrics

When inquiring check CP 8230 opposite last page

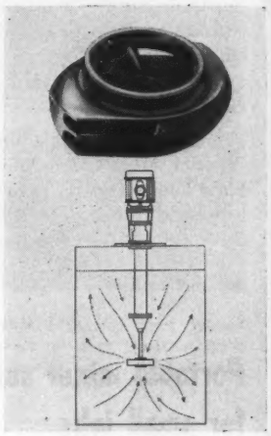
Turbulence, less channeling boost efficiency of German centrifugal mixer

operates on same principle as centrifugal pump

Uses: Mixing liquids, slurries, and emulsions of various consistencies and specific gravities.

Features: Mixer works on same principle as a centrifugal pump. Operation creates violent overall turbulence, eliminates channeling, and results in efficient mixing action.

Description: Mixer's impeller consists of an oval-shaped block with circular openings on top and bottom. Each opening is connected by curved channels to slots on side. When impeller turns, centrifugal force drives liquid out through slots. Liquid then flows into openings at top and bottom to replace that driven out.



Impeller on mixer is designed to draw liquid into holes at top and bottom and force it out through slots at sides

Suction increases with speed of rotation, causing heavy liquids to be drawn up from bottom of container and light liquids down from top. Corresponding increase in centrifugal force, as liquid rushes out through side slots, causes turbulent agitation at great velocity.

Units range in length from three to 10 feet (submerged depth). Special lengths can be built to order. Developed in Germany, mixers are available in various materials of construction. Units have double bearing system, with lower bearing located on shaft close to impeller. Additional guide bearings can be installed around shaft if desired for better operation.

(Rheinhuette type RKM centrifugal mixers are available in US through Neumann and Weaver, Inc., Dept. CP, 22-12 Raphael Street, Fairlawn, New Jersey . . . or for more information concerning manufacturer's product, reader may simply check CP 8231 on the convenient Reader Service slip which is located opposite last page.)

Pilot plant grinding simplified by mill that's "flexible"

Pilot plant grinding is simplified with company's recently-introduced steel head ball mill. Unit, mounted on a steel base, is designed for flexibility. Shell sections can be added or removed as required to more accurately duplicate mill problems. Same base is used whether mill consists of one or two shell sections. Motor and drive are part of packaged unit.

Feed is by scoop, but feed plate may be removed for direct feed by launder, chute, or pipe if this is more desirable.

(Ball mill for pilot plant and commercial grinding operations are available from Denver Equipment Co., Dept. CP, P. O. Box 5268, Denver 17, Colorado . . . or for more information reader may simply check CP 8232 on the convenient Reader Service slip which is located opposite last page.)

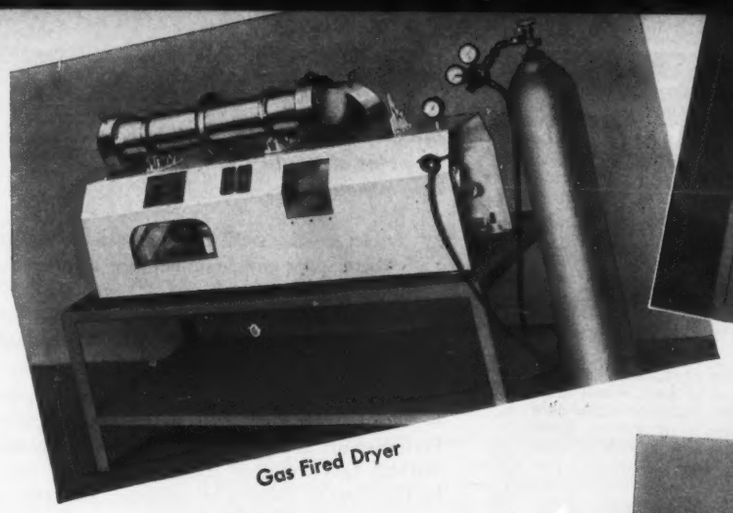
Bulletin shows, describes horizontal rotary filters

Horizontal rotary vacuum filters are pictured and described in four-page bulletin. Filters vary in size from 3 to 12 ft in diameter.

Recommended for coarse crystalline materials, fibrous pulps, and other free-settling applications, units are said to have high capacity, fast dewatering, and excellent cake washing characteristics.

Bul 202 is issued by Filtration Engineers, Inc., Dept. CP, 155 Oraton Street, Newark 4, N. J. When inquiring reader may simply specify CP 8233 on the convenient Reader Service slip which is located opposite last page.

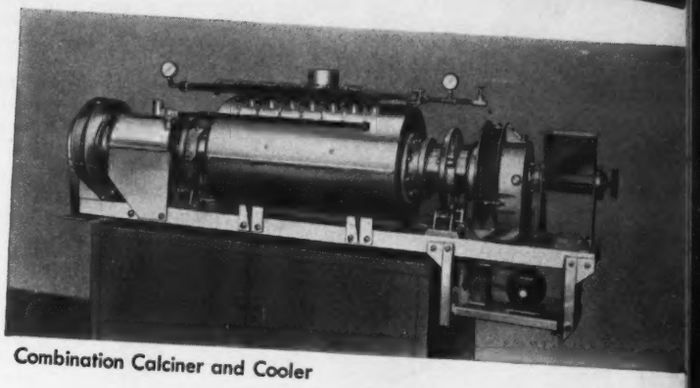
For more information on product at right, specify CP 8234 . . . see information request blank opposite last page.



Gas Fired Dryer



Steam Heated Dryer

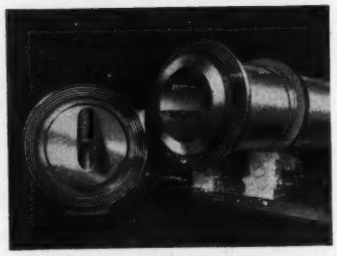


Combination Calciner and Cooler

DON'T GAMBLE!

Test run your products in our experimental

Dryers and Calciners



Labyrinth Seal on 60" x 32' 0" Stainless Steel Plastics Dryer showing the Mirror-like Finish on the Shell and Flights.



Special Stainless Steel Batch Dryer for Drying Fine Catalyst without Dust Loss.

• Establish definitely the heat sensitivity, permissible temperatures, entrainment losses, desirable velocities, "balling", sticking, cooling and all other chemical and physical aspects of the heat processing project *before* you build the production unit.

Our experimental and development laboratory can really save you time and money. In addition to the continuous gas-fired and steam heated dryer (operated parallel or counter-flow) and the continuous combination calciner and cooler shown above, the laboratory is also equipped with a steam jacketed batch pot type dryer, screening and other accessory facilities.

Send us samples of your products. Tell us the conditions and let our technicians make the test runs, preferably with your representatives present. All the test units illustrated have been standardized and are available for purchase by concerns maintaining their own testing laboratories.

DESIGNERS ENGINEERS

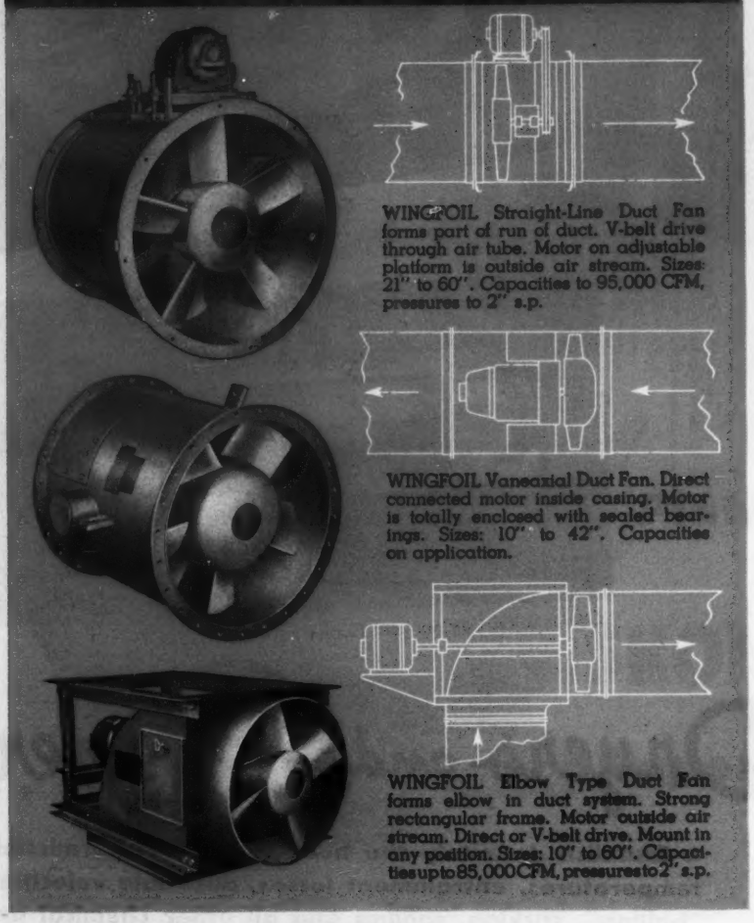
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FABRICATORS ERECTORS

Dryers • Coolers • Calciners • Kilns

"Builders of Equipment for People You Know"

Large Volumes of Air-- with Low Power Consumption



WINGFOIL Straight-Line Duct Fan forms part of run of duct. V-belt drive through air tube. Motor on adjustable platform is outside air stream. Sizes: 21" to 60". Capacities to 95,000 CFM, pressures to 2" s.p.

WINGFOIL Vaneaxial Duct Fan. Direct connected motor inside casing. Motor is totally enclosed with sealed bearings. Sizes: 10" to 42". Capacities on application.

WINGFOIL Elbow Type Duct Fan forms elbow in duct system. Strong rectangular frame. Motor outside air stream. Direct or V-belt drive. Mount in any position. Sizes: 10" to 60". Capacities up to 85,000 CFM, pressures to 2" s.p.

WINGFOIL DUCT FANS are your best bet, because of their strong, light-weight, rugged design, and the highly-efficient Wingfoil axial flow fan, which delivers high air volumes against static pressures with remarkably low power consumption.

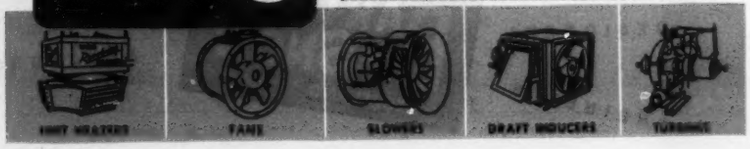
The three types of duct fan, shown above, come in a wide variety of sizes and capacities. They are designed to handle hot or cold, dust-laden or corrosive air or gases and for exhausting or supplying air. *Write for Bulletin. Use the coupon.*

L. J. Wing Mfg. Co. 179 Vreeland Mills Road, Linden, N. J.

Factories: Linden, N. J. & Montreal, Can.

Wing

L. J. Wing Mfg. Co., Linden, N. J. CP-7
Please send me bulletin on WINGFOIL DUCT FANS.
Name.....
Firm.....
Address.....
City.....Zone.....State.....



When inquiring check CP 8235 opposite last page

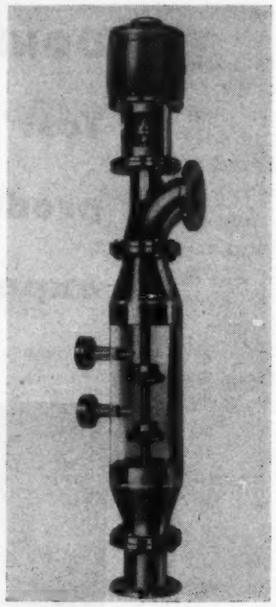
Blends, mixes instantaneously at point of liquid's entry into pipeline . . .

mixer can be used indoors or outdoors; useful where space and headroom are at premium

Uses: For mixing and blending liquids, slurries, or gases. Can also be adapted as low-lift high-capacity pumping unit.

Features: Mixers are installed right in pipeline — making them especially useful where space and headroom are at a premium. Units can be installed in vertical, horizontal, or inclined positions, and can be used either indoors or outdoors, wherever most convenient for job to be done.

Description: Mixers are reported as simple and rugged. Available with one or more stages, unit forms integral part of influent piping. Each stage consists of a diffusing impeller rotating in a blending chamber, driven by a continuous shaft connected to the motor.



Mixer can be installed in vertical, horizontal, or inclined position—right in pipeline

Introduction of liquid, gas, or slurry to each chamber is made through tube. Visual examination of mixing action is provided by transparent plastic observation port which may be opened for examination of the rotating element.

Head losses are said to be low. However, if additional head is required, a lift-stage employing an axial flow impeller may be incorporated into unit. Interior surfaces of body and diffusing chambers may be protectively coated for any requirement.

Mixers are available in sizes and capacities ranging from 1 to 10,000 gpm. These mixers can also be adapted for service as low-lift, high-capacity pumping units.

(Homomix mixers are product of the American Well Works, Dept. CP, 100 N. Broadway, Aurora, Illinois . . . or for more information about manufacturer's product reader may simply check CP 8236 on convenient Reader Service slip which is located opposite last page.)

At the center of your SEPARATION problem . . .



MERCO

The Merco continuous separation of liquids and suspended solids offers these advantages to the chemical processing industry:

MERCO Flexibility
Simple external regulation on a Merco centrifuge permits instant control and maximum flexibility.

MERCO Counterflow Feature
Merco's unique counterflow principle, using a return flow, enables you to—

- **Classify fine solids**
- **Wash minute particles**
- **Recover solubles**

MERCO Versatility
The outstanding and unusual features of a Merco Centrifuge permit a great variety of operations — clarification (solids removal), soluble recovery, classification, concentration, and washing.

MERCO Centrifugal Co.
AFFILIATE OF THE MERRILL COMPANY
150 Green Street, San Francisco, California

When inquiring check CP 8237 opposite last page

Many advantages offered by synthetic-fiber filter felts . . .

withstand 300 psi and permit high flow rates

Uses: As filter medium for most filters using cloths or screens.

Features: Synthetic filter felts are lightweight (less than 1/16" thick) and withstand pressures up to 300 psi. Non-woven structure permits high flow rates but with retention enough to hold back fine particles. Made of Nylon or Dacron, felts are easy to cut, and will not shrink or swell.

Product is reported as less expensive than woven material, but to have greater strength and longer life. Chemical and temperature resistance is good. Smooth "egg-shell" finish on one side makes cake removal easy and complete.

Description: Felts are pressed from a uniform mixture of fibers. Available in five different grades (in either Nylon or Dacron), they can be cut to any size up to a maximum width of 72". Material can also be supplied in rolls. Properties:

	Nylon	Dacron
Weight, oz/sq yd	10	10
Thickness, inches	0.030-0.045	0.026-0.035
Breaking strength, lb/2" width	335-175	243-129
Bursting strength, lb/sq inch	390-280	350-290
Porosity, % voids	59-72	43-64
Flow rate (water), gph/sq ft/8" head	180-1800	180-2170

(Filtaweb filter felts are product of Brosites Products Corporation, Dept. CP, 50 Church Street, New York 7, New York. Check CP 8238 opposite last page.)



Process puzzle?

Wondering which types of equipment to use in the process you're planning or revising? Each month, CHEMICAL PROCESSING brings you news about latest developments in filters, stills, evaporators, heat exchangers, dryers, other process units. Check the alphabetical Product Directory, pages 185 to 188.

Handling waters?

Do it better, cheaper...with

ALCOA ALUMINUM

DISTILLED WATER is regularly stored and piped in equipment made of ALCOA Aluminum. Neither hot nor cold distilled water attacks aluminum. A recent survey of thirty distilled water systems revealed that the water in all-aluminum systems was maintained at a higher purity than water from systems fabricated from other materials of construction.

DEIONIZED WATER of high quality has no action on ALCOA Aluminum. Uncontaminated rain water will not corrode aluminum either.

TAP WATERS vary greatly in their action on aluminum. While fresh and salt waters in the pH range 4.5—8.5 never cause general attack of aluminum even at the boiling point, certain of these waters cause pitting because they contain traces of heavy metal salts. Alclad aluminum alloys prevent perforation under these circumstances and generally are recommended for equipment handling fresh or salt water.

RECIRCULATED WATER. ALCOA Aluminum may be used with practically all recirculated waters. It often is desirable in the case of closed and cooling tower systems to employ inhibitors. Where inhibitors are uneconomical, Alclad alloys or cathodic protection may be effective.

ACID MINE WATERS. Aluminum alloys are employed for handling acid mine waters containing sulfides and sulfates. Although moderately corrosive to aluminum alloys, these waters are enough more corrosive to steel to make aluminum the economical material to use.

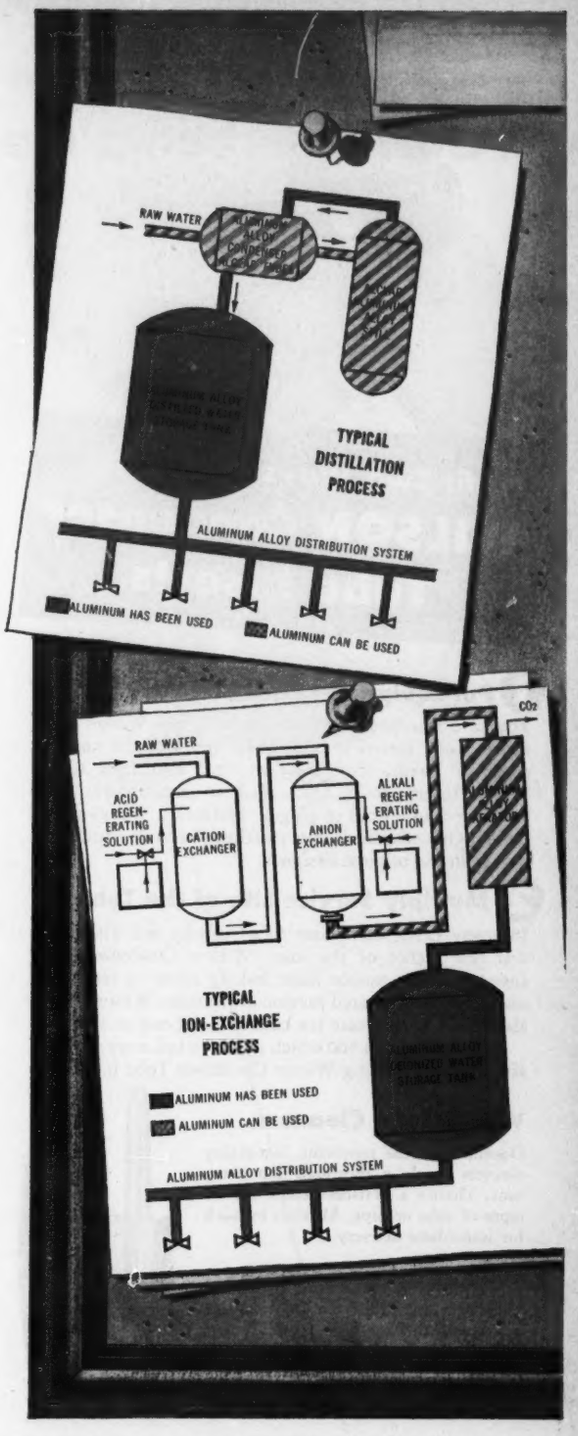
SEA WATER. In sea water, aluminum alloys show high resistance to attack. ALCOA wrought alloys 1100, 3003, Alclad 3003, 3004, Alclad 3004, 5052, 5054, 6061, Alclad 6061 and 6063 are preferred along with Alcoa cast alloys in 43, B214 and 356. Particular attention should be given to galvanic factors in design of equipment for service in sea water because of its high conductivity.

STEAM. Dry steam does not attack aluminum at temperatures up to 450°F. However, wet steam containing alkaline boiler compounds may be corrosive. The presence of carbon dioxide in steam is not harmful to aluminum. When aluminum steam lines or radiators are used, suitable traps should be installed to prevent carry-over of boiler compounds.

ALCOA's development engineers have firsthand experience with hundreds of such applications. To get in touch with them, simply write (on your company letterhead) to:

ALUMINUM COMPANY OF AMERICA.
902-G Alcoa Building, Pittsburgh 19, Pa.

Write today for our new, FREE book,
Process Industry Applications of Alcoa Aluminum



ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

When inquiring check CP 8239 opposite last page



Profit Two Ways With...

WILSON Condenser Tube Inserts

1 Put Equipment Back on Line Faster

You save man-hours and money with new Wilson Condenser Tube Inserts because they eliminate the need to plug. off leaking condenser or heat exchanger tubes. Wilson Inserts go in fast...need no cementing... take less time than it does to plug a "bad tube". What's more, these highly efficient inserts put the tube back into operation as in the original design.

2 Multiply Service Life of the Tube

In many cases, condenser tubes usually fail within the first few inches of the inlet. Wilson Condenser Tube Inserts actually restore these leaking tubes to service by sealing the deteriorated portion of the tube. Wilson Inserts also retard or eliminate the effect of inlet end erosion.

Send for Bulletin 500 which gives the full story on time-saving, money-saving Wilson Condenser Tube Inserts.

Wilson Tube Cleaners

Depend on these powerful, fast-acting cleaners to do a thorough job every time. There's a Wilson cleaner for all types of tube or pipe. All sizes in stock for immediate delivery.

Wilson Tube Expanders

For re-rolling old tubes or installing new ones. Precision-made to insure firm seating. Self-feeding and parallel expansion for a particular trade.



Representatives in principal cities

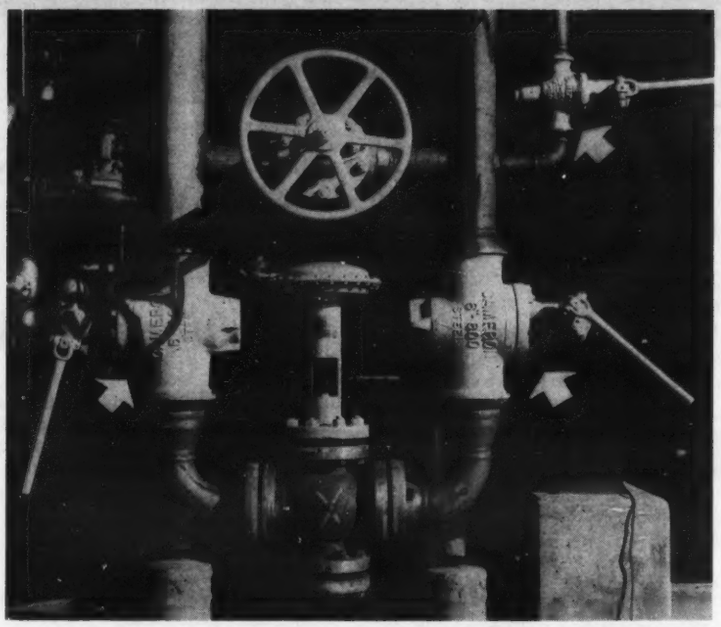
THOMAS C. WILSON, INC., 21-11 44th Ave., Long Island City 1, N. Y.
Cable address: "Tubeclean", New York

TW841

WILSON

TUBE CLEANERS • TUBE EXPANDERS

When inquiring check CP 8240 opposite last page



Stainless steel lift-plug valves (arrows) in control valve setup at the Celanese Pampa plant

Corrosion-resistant, non-lubricated lift-plug valves which are welded into line at Celanese —

eliminate leakage at flanges

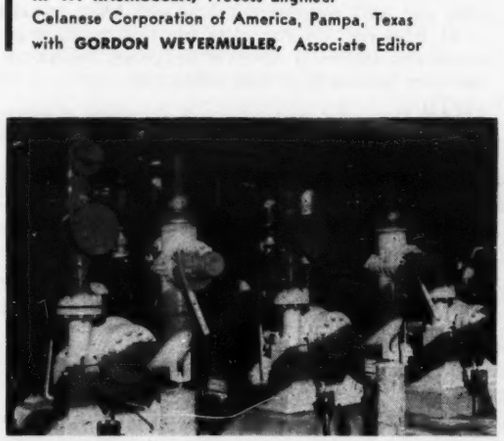
Teflon-packed valves need not be removed from line for servicing, seal without lubrication — preventing contamination of acetic acid

R. W. **RASMUSSEN,** Process Engineer
Celanese Corporation of America, Pampa, Texas
with **GORDON WEYERMULLER,** Associate Editor

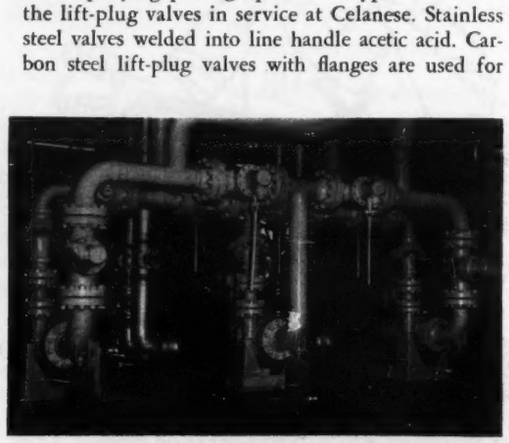
PROBLEM: When the Celanese plant at Pampa, Texas was being planned, an important consideration was the valves to be used in the process lines. Valves were required that could withstand the corrosive nature of acetic acid without contamination or leakage.

Solution: Lift-plug valves, which need no lubrication, were tested in a pilot plant at Clarkwood, Texas prior to the construction of the plant at Pampa. Application of these valves was principally in acetic acid service at elevated temperatures and pressures. Favorable results obtained with the valves in this pilot prompted their use in this critical service at the production plant in Pampa.

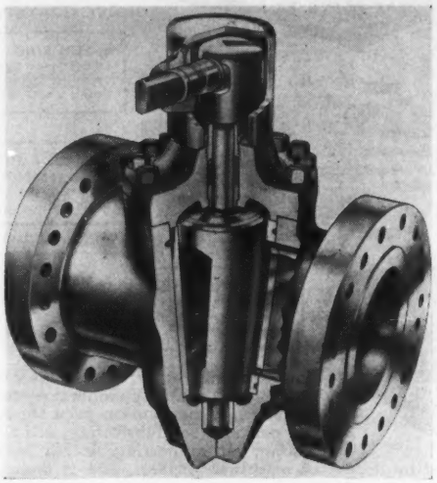
Accompanying photographs show typical views of the lift-plug valves in service at Celanese. Stainless steel valves welded into line handle acetic acid. Carbon steel lift-plug valves with flanges are used for



Note how these lift-plug valves in acetic acid service are welded into line



These carbon steel lift-plug valves with flanges handle absorption oil



Design permits seat and bonnet to be removed without disconnecting valve from line

handling absorption oil, propane, butane, and air.

Lift-plug valves require no lubricant between plug and seat in order to effect a seal. Cam-crank mechanism is operated by the principle of lifting-turning-reseating the plug. Once installed, valves need never be removed from line for servicing. Plug and seat are a separate unit and can be removed and replaced should they become damaged. This design allows valves to be welded into line where desired, eliminating flanges and gaskets.

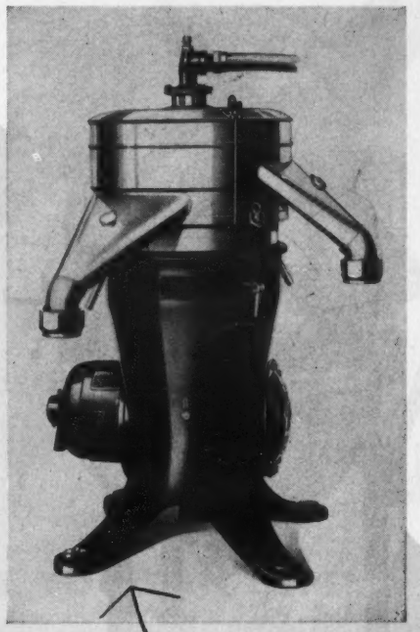
All valves for use at temperatures below 500°F are Teflon-packed. Design of valves permits them to be trimmed with a wide variety of materials to meet particular corrosive conditions. Of the 66 lift-plug valves in use at Celanese, 2/3 in acetic acid service utilize 316 stainless steel for body, bonnet, and seat. Plugs are fabricated from Hastelloy C.

Results: Possible leakage at flanges has been eliminated by design of the valves which permits them to be welded into the line. This has been a factor in the excellent appearance of the Celanese plant, as well as in helping to reduce losses of acetic acid. Also, since valves need not be removed from line for repairs, shutdown time and maintenance costs have been minimized.

Since no lubrication is needed for valves, possible contamination of products by lubricants is eliminated. This has also helped to maintain the high purity of the acetic acid produced. Valves, which were placed in operation when the plant went on stream the latter part of 1952, are in excellent condition in spite of the severe service.

(Non-lubricated lift-plug valves are product of Cameron Iron Works, Inc., Dept. CP, P. O. Box 1212, Houston 1, Tex. . . . or for more information check CP 8241 on handy form opposite last page.)

HOW MUCH TOO MUCH
IS "STOP-AND-GO" COSTING YOU?



"Stop-and-go" separating by means of filters and settling tanks is costly, time-wasting . . . and *unnecessary*.

De Laval Centrifugals streamline production by making separation, clarification and concentration *continuous* processes.

De Laval does in seconds what would otherwise take *minutes* or even *hours* . . . saves *time* . . . saves *money!*

What's equally important, in many processes De Laval Centrifugals also improve the product by doing a *more thorough* job of separation or clarification.

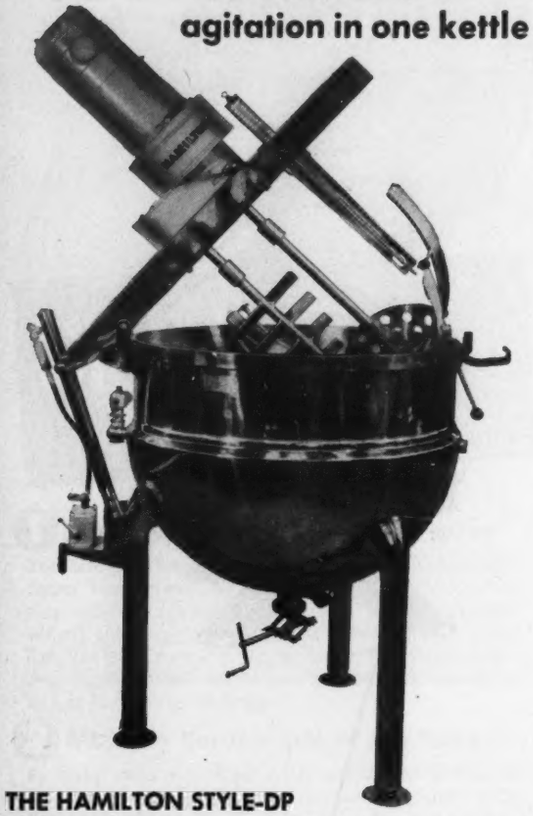
Let us show you exactly what De Laval Separators and Clarifiers can do for you.

DE LAVAL
for faster processing systems

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 61 Beale St., San Francisco 5

When inquiring check CP 8242 opposite last page

NOW... you just throw a lever and get single or double motion agitation in one kettle



THE HAMILTON STYLE-DP MIX COOKER'S primary agitator, with nylon scrapers, runs continuously when agitator is in operation, but the secondary agitator can be turned on or off independently, even while mixing. Agitators are easily and quickly removed to facilitate cleaning and to provide quick changeover to any one of four types of secondary agitators. Totally enclosed motor, either constant speed or variable speed. Stainless steel kettle incorporates every sanitation feature. Hydraulic lift for agitator and thermometer bracket are optional. Style-DP agitator unit can be used with three other styles of Hamilton kettles, so you're sure to obtain the exact mix cooker to fit your needs.



Write for Data Sheet H-16, Dept. D

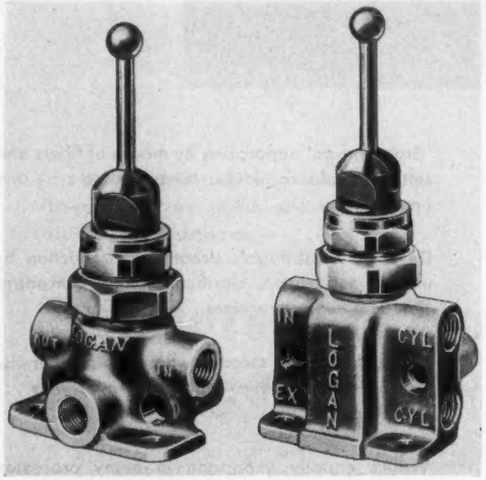
Hamilton copper and brass works
Division of the Brighton Copper Works, Inc. • 820 State Ave., Cincinnati, O.

When inquiring check CP 8243 opposite last page

Announce three air control valves with locking toggle

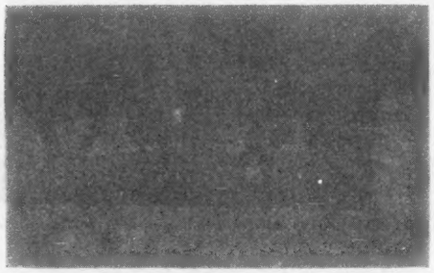
First of three air-control valves announced by company is Model 6664 designed for control of bleeder and pilot-operated master valve. Removing plug in lower (center) port makes 2-way valve into 3-way valve. Operated by hand, valve will lock in off-center (angle) position and is released manually to vertical (off) position. Unit is designed for side or base mounting; port is ¼".

Dual control 2-way Model 6665 is similar to Model 6664 but has two exhaust openings which permit bleeding both ends of master valve alternately. This provides automatic reversal when toggle lever is returned to normal (vertical) position.



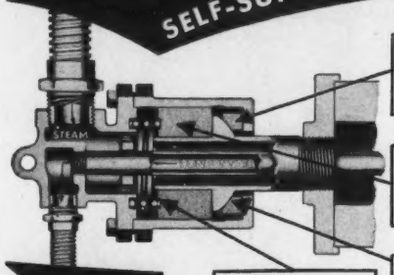
Model 6676 is a 4-way, 2-position valve with locking toggle lever, side or base mounting, ¼" port. It is designed for manual control of double-acting air cylinders.

(Air-control valves are products of Logansport Machine Co., Inc., Dept. CP, 835 Center Ave., Logansport, Ind. Check CP 8243A opposite last page.)



"Who turned off the dust collector?"

JOHNSON Rotary Pressure JOINT
SELF-SUPPORTING TYPE



Only 4 Internal Parts

For introducing steam and liquids into rotating rolls and cylinders, there's nothing like the Johnson Joint above. It's packless, self-lubricating, self-adjusting, self-supporting. It has been adopted by dozens of machinery makers, and is finding new uses every day.

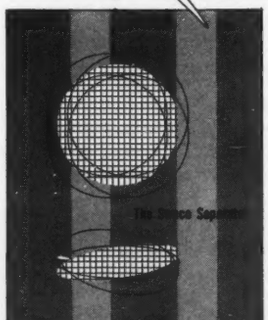
Type SB shown handles both steam and condensate through same head; also available for through flow service, and in sizes and styles for all operating conditions. *Write for literature.*

The Johnson Corporation
826 Wood St., Three Rivers, Mich.

When inquiring check CP 8244 opposite last page

Send for new 22-page

SCREENING CATALOG



Photos, drawings, detailed specifications of equipment now successfully screening

241 different materials
wet and dry
coarse and fine
heavy and light.

Southwestern Engineering Company
4[illegible] Santa Fe Ave., Los Angeles 58, Calif.
Please send Catalog No. 47-3

name *title*
company
address
city *zone* *state*

When inquiring check CP 8245 opposite last page

For pressures to 5000 psi — variable-delivery hydraulic pumps . . .

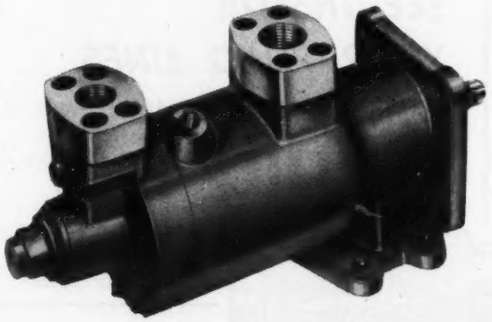
deliver 3 gpm at 1200 rpm, 4 gpm at 2000 rpm, provide over 11 hydraulic hp

Uses: For hydraulic systems requiring constant high pressures with control of fluid delivery from zero to full flow.

Features: Generating continuous-duty pressure up to 5000 psi, pumps deliver 3.0 gpm at 1200 rpm; at maximum continuous speed of 2000 rpm, and full rated pressure, they deliver 4.0 gpm and provide over 11 hydraulic hp.

Change in flow rate is accomplished by design originally developed for high-speed, high-pressure aircraft pumps. Piston travel remains constant, but effective pumping stroke is determined by position of axially-movable piston sleeves. As the sleeves move forward, they uncover a series of radial venting holes in the pistons, allowing an increasing amount of fluid to be discharged back into pump case, and proportionally reducing flow to the work.

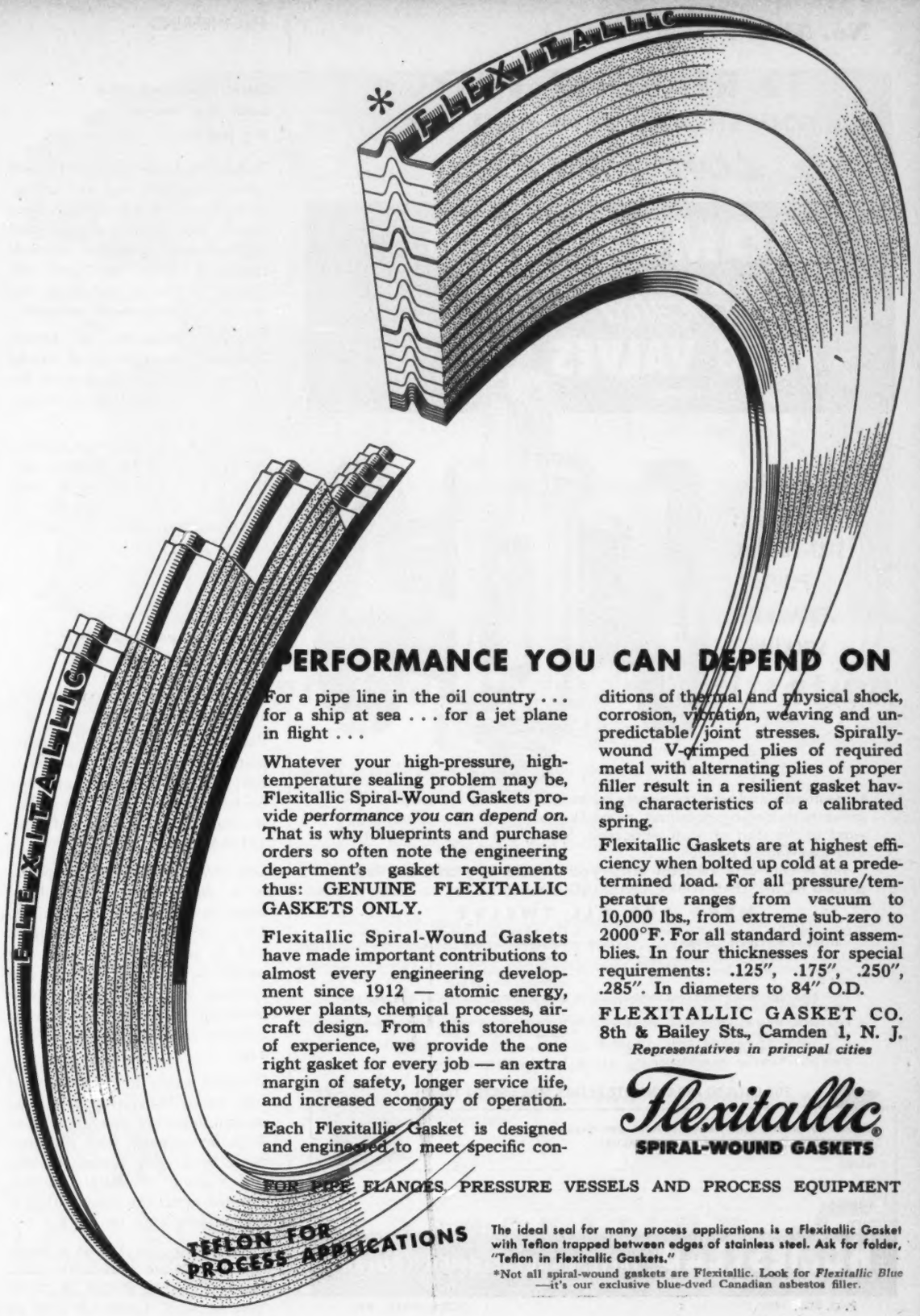
Description: Two kinds of variable-delivery controls are available. Series PVM-600 pumps are equipped with a handwheel control for manual adjustment of output. Series PVC-600 pumps incorporate a pressure compensated control for automatic regulation of pressure and flow.



Change of flow rate of pumps is accomplished by design developed for aircraft pumps

Pumps are of the axial piston type, with nine equally spaced pistons in a fixed cylinder block. Torque applied to drive shaft is converted by drive cam to produce reciprocating motion of pistons. These pumps are not affected by variations in inlet pressure or fluid temperature and are self-priming and self-lubricating.

(PV-600 series variable-delivery pumps are products of Dudco Division, New York Air Brake Co., Dept. CP, 1700 E. Nine Mile Road, Hazel Park, Michigan . . . or for more information about manufacturer's product check CP 8246 on handy form which is located opposite last page.)



PERFORMANCE YOU CAN DEPEND ON

For a pipe line in the oil country . . . for a ship at sea . . . for a jet plane in flight . . .

Whatever your high-pressure, high-temperature sealing problem may be, Flexitallic Spiral-Wound Gaskets provide *performance you can depend on.* That is why blueprints and purchase orders so often note the engineering department's gasket requirements thus: GENUINE FLEXITALLIC GASKETS ONLY.

Flexitallic Spiral-Wound Gaskets have made important contributions to almost every engineering development since 1912 — atomic energy, power plants, chemical processes, aircraft design. From this storehouse of experience, we provide the one right gasket for every job — an extra margin of safety, longer service life, and increased economy of operation.

Each Flexitallic Gasket is designed and engineered to meet specific conditions of thermal and physical shock, corrosion, vibration, weaving and unpredictable joint stresses. Spirally-wound V-crimped plies of required metal with alternating plies of proper filler result in a resilient gasket having characteristics of a calibrated spring.

Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000°F. For all standard joint assemblies. In four thicknesses for special requirements: .125", .175", .250", .285". In diameters to 84" O.D.

FLEXITALLIC GASKET CO.
8th & Bailey Sts., Camden 1, N. J.
Representatives in principal cities

Flexitallic®
SPIRAL-WOUND GASKETS

FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

The ideal seal for many process applications is a Flexitallic Gasket with Teflon trapped between edges of stainless steel. Ask for folder, "Teflon in Flexitallic Gaskets."

*Not all spiral-wound gaskets are Flexitallic. Look for *Flexitallic Blue* —it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 8247 opposite last page

No. 5* of . . .

12 REASONS WHY
YOU SHOULD BUY AND USE
LOW-PRICED

HOMESTEAD
Lubricated
PLUG VALVES

Pat. Pending



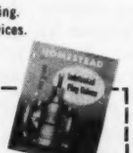
Homestead's exclusive completely controlled lubricant system positively prevents sticking by its instant, piston-like movement of the plug downward at the start of each lubrication. Spring and line pressure return it to stem-sealed position.

This is only one reason why you should buy and use low-priced HOMESTEAD LUBRICATED PLUG VALVES.

HERE ARE ALL TWELVE

1. Extra long valve life assured by very close tolerance between sealing surfaces.
2. Straight line fluid flow—streamlined ports—minimum resistance to flow—minimum pressure drop.
3. Triple head seal—two lubricant rings and reinforced Teflon stem seal prevent leakage.
4. Easy turning—plug floated on Teflon washer and reinforced Teflon ring.
5. Leak-proof double ball and lubricant sealed check valve. No springs. No maintenance.
6. Full-threaded screw prevents dirt being forced into lubricant system.
7. Quarter-turn fully opens or closes.
8. Reinforced Teflon stem seal—no cold flow—continuous, positive seal.
9. Seating surfaces protected in both open and closed positions.
10. High pressure lubricant system provides full lubricant seal around ports.
11. Self-freeing plug prevents sticking.
12. Two lubricants handle most services.

FOR CATALOG AND COMPLETE DETAILS MAIL COUPON TODAY



Without obligation, send Reference Book 39—Section 5 on HOMESTEAD LUBRICATED PLUG VALVES.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

HOMESTEAD VALVE MANUFACTURING COMPANY

Serving Since 1892

P. O. BOX 140 **CORAOPOLIS, PA.**

When inquiring check CP 8248 opposite last page

Bend pipe and tube with one tool—it's portable

Portable hydraulic tool can be used for bending both pipe and tubing. Incorporating a recently-developed frame, unit will bend pipe and rigid conduit, as well as thinwall conduit (EMT), hard and soft copper, aluminum and steel, and any other tubing in 90° and 180°.

Increased versatility of bender eliminates inconvenience of having different kinds of benders on the job. Existing equipment can be converted.

(One Shot pipe and tube benders are products of Tal Bender, Inc., Dept. CP, 417 N. Water St., Milwaukee 2, Wis. . . . or check CP 8249 on handy form opposite last page.)

Removes rust and scale and rinses easily

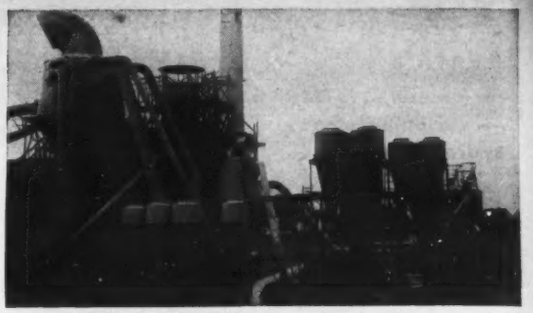
Uses: Primarily for pickling and scale-removing.

Features: Acid detergent is reported to remove light to moderate rust, heat scale, tarnish, and other oxides, as well as normal shop dirt. It meets specification MIL-M-10578A, Type III.

Description: Cleaning compound is a non-viscous, amber-colored liquid having a pH range of 1.5 to 1.0 at 70°F, and a bulk density of 11.0 lb per gal. It is completely soluble in water or alcohol, and possesses excellent rust- and soil-removing properties as well as effective inhibition for iron and steel.

It rinses easily in both hot and cold water. Material may be used in concentration range of 5 to 30% by volume, with solutions made by stirring compound into full volume of water. Recommended operating temperature is from room temp to 160°F.

(Compound No. 131 is a product of Oakite Products, Inc., Dept. CP, 118F Rector St., New York 6, N. Y. Check CP 8250 on handy form opposite last page.)



Foreground, DUSTMASTERS. Background, old collectors being removed.

Banister DUSTMASTERS solve large manufacturer's dust problem!

In order to eliminate a dust nuisance and also collect usable product, the company modernized its dust collecting system with Banister DUSTMASTERS. Before replacing the old system, extensive tests were made to determine which equipment would do the job best at a moderate cost.

DUSTMASTERS were selected on the basis of the findings. They have greatly improved product recovery, eliminated a public nuisance, and solved long standing maintenance problems.

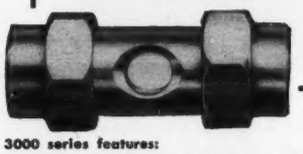
Our engineering and manufacturing facilities are at your service. Your inquiries will receive prompt attention. Send for Catalog and material showing how DUSTMASTER Systems solved many so-called impossible dust collecting problems.

A. W. Banister Company, 21 Charles St., Cambridge, Mass.

When inquiring check CP 8251 opposite last page

SEE INSIDE YOUR FLUID LINES WITH THE NEW
LIQUID EYE®
INDICATOR

3000 SERIES (ILLUSTRATED)



3000 series features:

- High pressure Pyrex sight glass.
- Pressure-sealed Neoprene sealing rings at both ends.
- Withstands operating pressures of 600 psi. and temperatures of 300° F. continuously.
- Unrestricted full line flow.
- Ruggedly constructed of cadmium plated steel.*
- Ideal for wide variety of applications.

***Can be furnished in stainless steel on special order. Standard sizes — ¾", 1" and 1-¼" i.p.s. and ¼" thru 1-⅛" tube sizes.**

You'll find there's a "LIQUID EYE" designed to fit your application, too. An Allin representative is ready to help you choose from a most complete line of Liquid Eyes, or work with you on any special design.

Send for Catalog D-55 covering the complete Allin line.

Allin MANUFACTURING COMPANY
1153 W. Grand Ave., Chicago 22, Ill.

When inquiring check CP 8252 opposite last page

Blast-cleaning time cut 50% by dustless, non-metallic spherical shot . . .

reduces wear on hoses and nozzles and can be reclaimed for reuse

Uses: In production, maintenance blast-cleaning.

Features: Blast-cleaning time can be reduced as much as 50% with one-third less material, as compared to sand. Spherical characteristic of mineral shot reduces wear on mixing chambers, hoses, and nozzles of blasting equipment. In addition, because mineral shot flows more freely and requires a lower impact velocity, lower blasting pressures and therefore reduced power costs are obtained.

Spherical mineral shot blast cleans uniformly in one pass with no dust clouding operator's vision. Shot can be reclaimed.

Description: Blast-cleaning shot contains only 0.1% free silica by X-ray diffraction tests and therefore constitutes no health hazard. It is chemically inert in the presence of moisture and will not discolor metallic or non-metallic surfaces. Since mineral shot does not absorb moisture, it can be left in blast-cleaning equipment with no danger of corrosion and will not clog in lines and mixing chambers.

(Mono-Kleen blast-cleaning shot is a product of Baldwin-Hill Company, Dept. CP, 881 Breunig Ave., Trenton, N.J. . . . or for more information check CP 8253 on handy form opposite last page.)

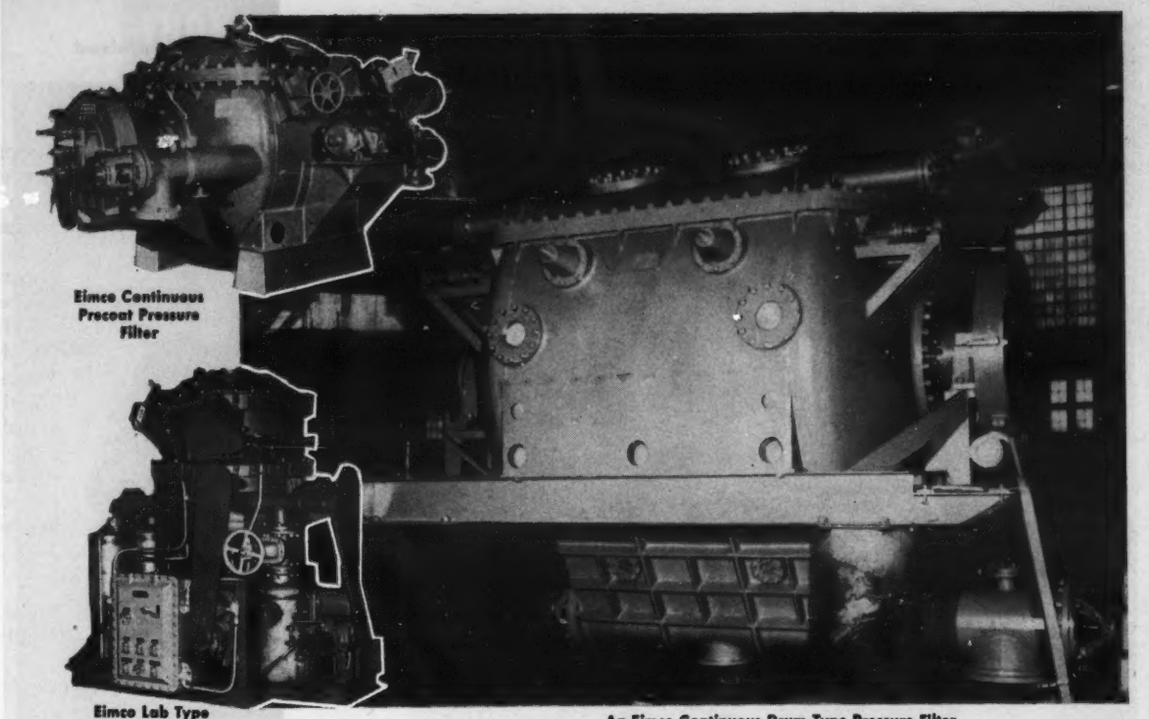
Spraying cycle can be timed by automatically-controlled spray nozzle

Uses: Production spraying operation where intermittent spraying is needed. For example, in a typical application, spraying cycle is timed to passing of parts on a conveyor belt. Result is material savings in spraying solution and prevention of flooding of conveyor.

Features: In operation, nozzle is turned on or off by compressed air actuating an air piston in nozzle. In this design, air is not used for atomization, spray being produced by hydraulic pressure alone.

Description: Spray nozzles are supplied with standard interchangeable orifice tips, producing flat, hollow, and full cone sprays in a wide range of capacities. Maximum recommended capacity, however, is 0.80 gallons per minute. If required, pneumatic atomizing nozzles with automatic control mechanism can be supplied.

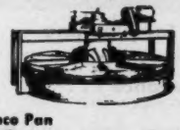
(1/4JAUH hydraulic spray nozzles are products of Spraying Systems Co., Dept. CP, 3216 Randolph St., Bellwood, Illinois . . . or for more information check CP 8254 on handy form opposite last page.)



Eimco Continuous Precoat Pressure Filter

Eimco Lab Type Continuous Pressure Precoat Drum

An Eimco Continuous Drum Type Pressure Filter



Eimco Pan Filter



Eimco Pressure Roll Filter



Eimco Bi-Carb Filter



Eimco Agidisc Filter

Continuous Pressure Filtration

offers a means of solving difficult process problems which have heretofore been unanswerable.

These filters are offered only after the problem has been studied by Eimco's Research and Development Division and each filter station is then designed and constructed to handle each user's problem on an assured result basis.

Pilot plant operations are conducted on proportional sized filtration equipment of all types in Eimco's Research and Development Center or in the customer's own plant.

Successful production size installations based on findings made by Eimco's Research and Development Division prove the value of starting new flow sheets through this thorough and exhaustive method of testing to obtain all the facts.

Let us tell you more about Research in liquids-solids separation through filtration.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Ostelsheid, England Paris, France Milan, Italy Johannesburg, South Africa

B-124

When inquiring check CP 8255 opposite last page



Pangborn answers the



"Call from Philip Morris"

Collects 5,000 lbs. of tobacco particles daily to be sold for salvage.

At the stemmery plant of Philip Morris and Co., Ltd., Richmond, Va., the tobacco used in Philip Morris products is processed prior to manufacture into cigarettes. To keep the working area immaculate and maintain the excellent operating conditions, Philip Morris calls upon four Pangborn Dust Collectors for efficient removal of any minute tobacco particles released in this processing. Every day, Pangborn Dust Control collects 5,000 lbs. of particles which are sold as fertilizer ingredient. In addition, Pangborn minimizes plant housekeeping problems.



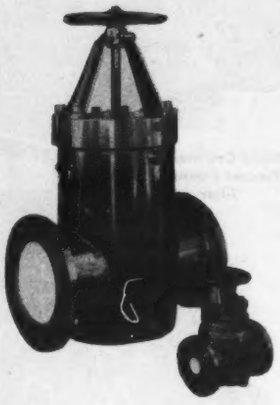
Pangborn can solve *your* dust problem. Pangborn engineers will be glad to show you how Pangborn Dry or Wet Dust Collectors can save you time, trouble and money.

See how Pangborn benefits varied industries. Write for free copy of "Out of the Realm of Dust." Pangborn Corp., 2700 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control and Blast Cleaning Equipment.*

Pangborn
CONTROLS DUST

When inquiring check CP 8256 opposite last page

Shutdown time minimized by replacement insert for worn valve seat



Completely jacketed gate valve need not be removed from processed line to remachine seats. Replacement inserts can be installed quickly — minimizing shutdown time. Valves in line size 1½ through 4", are available in cast iron, steel, bronze, Ni-Resist, and stainless steel. Valves in line size 6 through 10" are made of fabricated steel or stainless steel.

(All-Jacketed gate valves are products of Hetherington & Berner, Inc., Dept. CP, 701-745 Kentucky Ave., Indianapolis 7, Ind. . . . or for more information check CP 8257 opposite last page.)

Suggestions for planning a program for proper plant maintenance . . .

records, tests, tools, and training are important highlights

Set up complete records of all equipment, structures, and services. These should include all categories such as chemical, mechanical, and electrical equipment, protective equipment, handling units, buildings, grounds, etc. Under each heading there should be detailed sub-divisions such as steam, electricity, chemicals, water, etc, with further subdivisions under each.

Each unit of equipment should have a card designating manufacturer, location, class of work performed, day-week schedule, history of repairs, various technical requirements for proper operation, reports of downtime, and types of failures.

Determine the most desirable amount of maintenance. Any unit which on failure will stop production, if it represents a sizable capital investment, and if its failure will injure health and safety of employes, automatically comes under the heading of a "must" maintenance schedule. Some other machines may best be left until they break down, inasmuch as their value in the overall picture will be negligible.

Test and determine the present condition of each item to be maintained, and list the steps necessary

Strahman

HIGH PRESSURE GAUGES

USED IN* REFINERIES *AND* CHEMICAL PLANTS *THROUGHOUT THE WORLD



THRU VISION



REFLEX
Single or Multiple Sections

TUBULAR

Gauge Cocks
•
Large Chamber Reflex Gauges
•
Heated or Cooled Gauges



***SEND FOR* COMPLETE CATALOGUE**

STRAHMAN VALVES, Inc.
16 Hudson St., New York 13, U.S.A.

When inquiring check CP 8258 opposite last page

to keep the equipment in running condition. For example, a failing motor can be fixed by: 1) replacement of entire machine, 2) a new armature, 3) rewinding of armature only, and 4) making of the damaged coils. By checking each phase's downtime loss, cost of spare parts, and repair labor costs, it is easy to analyze the exact cost of total failure and the degree of protection needed.

Analyze spare parts required with regard to invested money in stock, handling, storage, insurance costs, labor required (including clerical) obsolescence, etc, and inventory required to care for the varied turnover requirements.

Buy the best tools. It's not necessary to budget for these on a "once a year" basis. Just as the proper lift truck or screwdriver can save its weight in gold, so the use of modern tools can cut shut-down time and maintenance payroll considerably. Thus, a test-board for electrical equipment is a valuable timesaver. Apply the same principle when buying materials. Quality materials prove less costly in the long run.

Set up a department wherein all work orders adequately describe work requested and work performed on each piece of equipment. This should take into consideration repairs, new work, alterations, general maintenance, and service to operations.

Educate all departments as to the value of planned maintenance. A really effective program must have the cooperation of everyone concerned.

Set up a training program for maintenance personnel, so they will know how to do their job and why they are doing it. A good maintenance program raises morale, produces better results, and inspires personnel to take pride in their work.

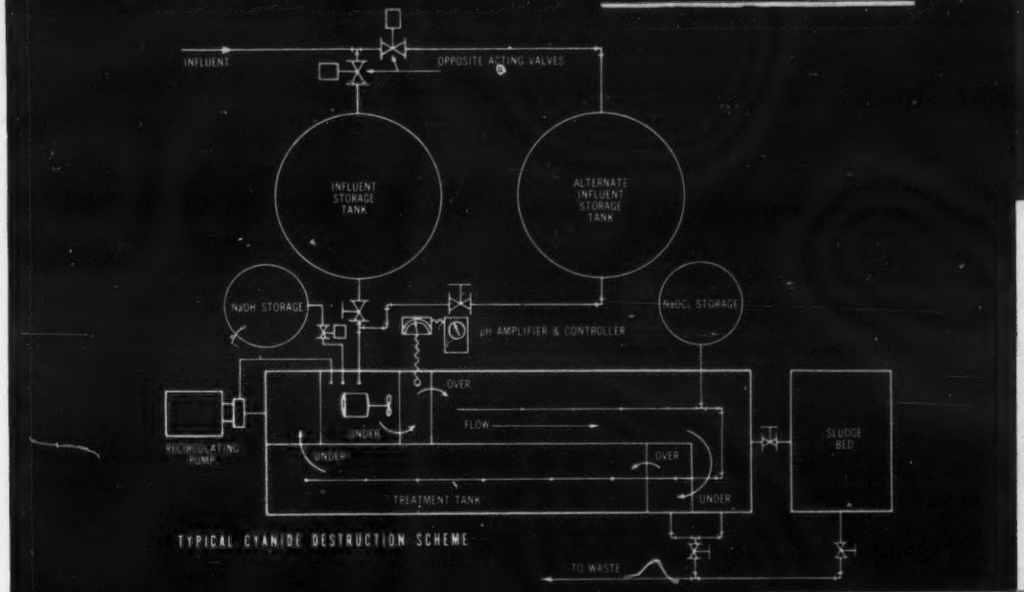
Standards are an essential underlying factor in any production unit. Much more can be done for the present state of operation but, above all, they should be considered in planning for the new automatic plant and the best maintenance. Proper planning saves parts inventory, affords smoother production flow, and reduces employe training time.

The results are reduced costs, more uniform products, better output, less waste, better operations, to mention a few. Standards are not only an instrument of industrial planning and control. They are vital in eliminating the custom unit for the application of mass production so that the medium-size shop can benefit from automatic operation. *Now* is the time to standardize your operation and unscramble the bottlenecks, and delays.

(From an address, "Proper Plant Maintenance and Modernization," by Bernard Eichwald, President, B. Eichwald & Company, Inc., 237 W. 39th St., New York, given before the Young Presidents Organization 5th annual convention, Phoenix, Ariz., April 1955.)

INDUSTRIAL WASTE TREATMENT SYSTEMS

CUSTOM ENGINEERED BY WAGNER BROTHERS



TYPICAL CYANIDE DESTRUCTION SCHEME

Wagner Brothers' engineers will design and install any type of waste treatment system, custom engineered to accommodate your particular plant requirements.

With Wagner Brothers Waste Treatment systems, you can be sure of *positive, economical* waste treatment requiring a *minimum of operating and maintenance cost.*

Write now, giving full details of your waste problems.

COMPLETELY ENGINEERED INSTALLATIONS FOR:

- CYANIDE DESTRUCTION
- CHROMIUM RECOVERY OR DISPOSAL
- OIL EMULSION SPLITTING
- ION EXCHANGE

WAGNER BROTHERS, INC.

520 MIDLAND • DETROIT 3, MICH.

REPRESENTED IN

CHICAGO • ROCHESTER • CLEVELAND

CINCINNATI • INDIANAPOLIS • NEW YORK

WAGNER BROTHERS, INC.
520 Midland Ave.
Detroit-3, Michigan

☐ Please have representative call to discuss our waste treatment problems.

☐ We are briefly describing our present waste treatment problem on the attached sheet. Please recommend the best method of processing.

NAME_____ TITLE_____

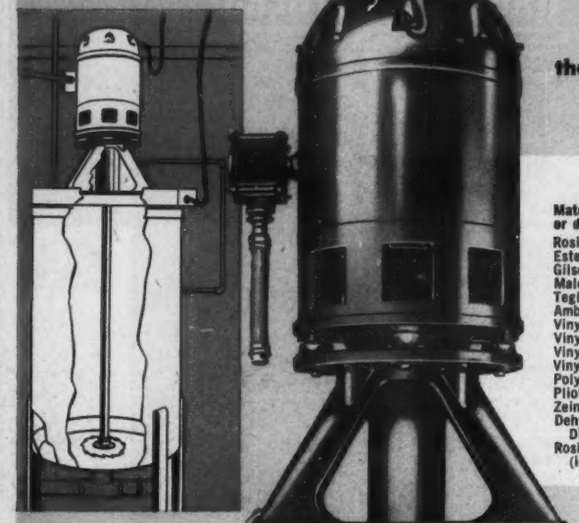
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

When inquiring check CP 8259 opposite last page

COWLES DISSOLVER GIVES YOU SPEED AND ULTIMATE DISPERSION



Performance guaranteed! 2 to 20 times faster than conventional units. For dispersion, dissolving, and deagglomeration of materials.

COWLES SAVES TIME IN THESE OPERATIONS

Material dissolved or dispersed	Look at the Cowles time!	Material dissolved or dispersed	Look at the Cowles time!
Rosin	8 Times Faster	Cellulose Acetate	6 Times Faster
Ester Gum	10 " "	Methyl Cellulose	2 " "
Gilsonite	4 " "	Flour Starch Dispersion.	2 " "
Maleic Resin	8 " "	Gas Dispersion Reaction.	2 " "
Teglac 161	9 " "	Starch Dispersion	2 " "
Amberol 801	8 " "	Scrap Film Washing	32 " "
Vinyl Resin VYHH	12 " "	Pigment Chip Dispersion	16 " "
Vinyl Resin VYLF	12 " "	Paint Paste Tinting	12 " "
Vinyl Resin VYNS	12 " "	Casein Emulsion Preparation	3 " "
Vinyl Resin AYAF	8 " "	HT Clay Dispersion	9 " "
Polyethylene	24 " "	NoKarb Clay Dispersion..	4 " "
Pliolite	24 " "	Enamel Tinting	9 " "
Zein A	24 " "	N/C Dissolving	3 " "
Dehydrated Milk Dispersion	4 " "	Compounding in Latex ..	7 " "
Rosin Disintegration (in water)	9 " "	Ethyl Cellulose	4 " "



Model 200 Cowles Dissolver. Many models in many sizes available.

You'll save space, save power, save labor, save maintenance costs with Cowles! Not only is Cowles many times faster than ordinary machines—but it speeds production on subsequent equipment, adds profits for your entire operation. And the Cowles is adaptable to many jobs, giving you terrific flexibility of production! Handles even high viscosities at great speed!

Sturdy construction... precision engineered for high-speed operation. Easy to operate and clean. The Cowles is available in many standard models. If you have a unique situation that requires other than a standard model, we will engineer equipment to meet your exact needs.

All Cowles Dissolvers, like Morehouse Mills, are sold on a guaranteed performance basis. Ask for pre-test of your materials by Morehouse-Cowles technicians. Test Cowles equipment free of charge in your plant. Inquire about time payment plans and leasing arrangements.

WRITE TODAY for full information!

USE THE COWLES CONVENIENTLY AND PROFITABLY...

- **...in milling operations,** as pre- or post-mix unit.
- **...in chemical processing,** as a high-speed reactor—for gas-liquid, liquid-liquid and solid-liquid reactions.
- **...in paper manufacture and conversion,** as pigment dispersion unit on all types of coatings—preparation of polyethylenes in wax, and all types of coating varnishes.

IF YOU PROCESS... Paints • Foods • Chemicals • Lubricants • Ceramics • Inks Pharmaceuticals • Dyes • Plastics • Emulsions

Patented in U.S.A. and Foreign Countries.

MOREHOUSE MILLS for faster particle reduction

MOREHOUSE COWLES

Up to 4 times the volume of ordinary mills when used with conventional mixers... but when used with Cowles, the Morehouse Mill has delivered up to *10 times the volume of ordinary mills!* For grinding, homogenizing, emulsifying, dispersing, disintegrating, blending... Morehouse Mills mean speed, volume, profits.



MOREHOUSE-COWLES, INC., 1150 San Fernando Rd., Los Angeles, Calif.
Sales Offices in Principal Cities (Cable Address "MORESPEED", Los Angeles)

¡Atencion! Tenemos disponible literatura en una variedad de idiomas. Escribanos en su propio idioma.

When inquiring check CP 8260 opposite last page

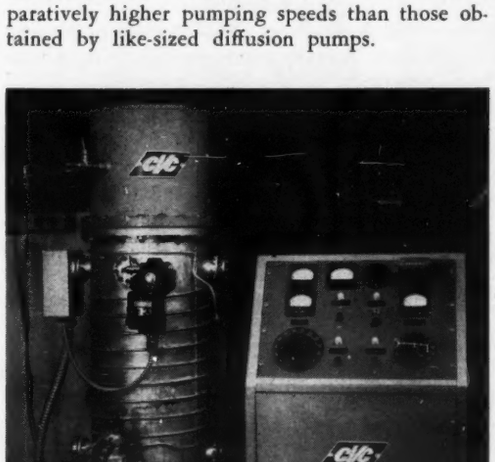
Gettering action of ion pump reduces ultimate pressures to 0.0000001 mm

gas molecules are removed by titanium evaporation and ion pumping at comparatively high speeds

Recommended for non-cyclic, static vacuum systems, ion pump reduces ultimate pressures to range of 0.0000001 mm Hg. These low pressures are produced in absence of organic vapors and without costly refrigerated traps and baffles. Backstreaming of oil vapor is nonexistent.

All gas molecules, regardless of their chemical nature, are removed from the vacuum chamber either by the gettering action of evaporating titanium or by ion entrapment. In essence, gas molecules are not "pumped" from the chamber. They are captured and deposited in such a fashion as to prevent any further wandering.

Through combined application of metal evaporation and ion pumping, common gases are easily gettered and inert gases, as well as common gases, are ionized and accelerated. The result is comparatively higher pumping speeds than those obtained by like-sized diffusion pumps.



Cabinet (right) houses electronic controls for operation of the ion pump

How it works — Electronically operated, pump utilizes gettering action of evaporating vacuum-annealed titanium. This metal was chosen for its greater chemical activity with such gases as H_2, N_2, and O_2. In addition, vapor pressures of titanium compounds are very stable at room temp.

Ion pump is initially "ranged" to a pressure of 25-30 μ Hg. At this point, mechanical pump is valved-off and the ion pump is self-sustaining. A

primer Ti charge is fired by resistance heating and reduces pressure to the order of 0.1 μ Hg.

Electron bombardment of the post is then activated and continuous Ti evaporation takes place. The gettering action produces an ultimate pressure of 0.0001 μ Hg. Lower pressures are obtained solely through ion pumping Filament structure and Ti wire supply are designed to permit uninterrupted operation for a period of six months.

Installation — Ion pump is flanged on both ends of a straight-walled casing to permit mounting either above or below the vacuum chamber. Each flange is designed to take an O-ring gasket or a flat metal gasket. The latter is recommended for ultra high vacuum work, since it eliminates outgassing of conventional elastomers.

Electronic control circuit can be housed in a portable or stationary cabinet that's either adjacent or some distance from the pump. With a multiple pump installation, a central control panel may be used to offset duplication of electronic controls.

A single mechanical pump is needed to "rough" the ion pump, and a side arm connection is provided for this. With a multiple installation, one mechanical pump can be manifolded to the bank.

Pump Data

Casing dimensions	
Nominal diameter (inches)	12
Length (inches)	25 5/16
Connecting flanges (2 each)	
OD (inches)	19
Bolt circle (inches)	17
Side arm port	
OD (inches)	6
ID (inches)	3 ¾
Weight (lb, approx. net)	70
Water cooling rate (gpm)	1
Ti wire diameter (mils)	20

Power Supply Data

Electrical (volts @ 60 cy AC)	115
Cabinet (inches)	
Height	41
Depth	25
Width	22
Weight (lb, approx. net)	300

(Type 3161-01 Evapor-Ion pump is a product of Consolidated Vacuum Corp., div. of Consolidated Engineering Corporation, Dept. CP, 1775 Mt. Read Blvd., Rochester 3, N.Y. . . . or check CP 8261 opposite last page.)

Your guide to more ideas concerning Engineering and Maintenance . . .

is the handy Product Directory on pages 185 to 188. All products and services discussed in this issue, in either editorial or advertising, are listed there.

No seals

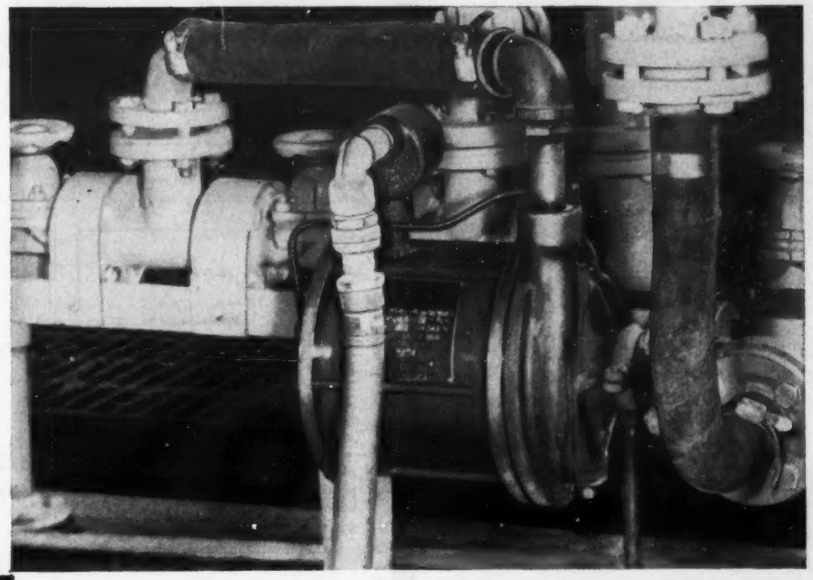
No stuffing box

Chempump

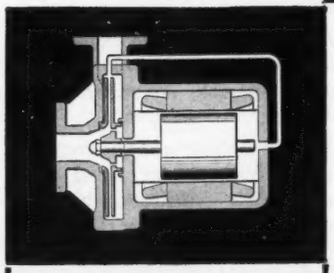
now used

in plating operations

at Western Electric Company



Leak-proof *Chempump* installed on 270-gallon plating machine at Western Electric Co.'s Allentown, Pa. plant. Seal-less unit pumps 10 gpm of solution at 155°F against a head of 35 ft.



Chempump combines pump and motor in a single hermetic unit. Pumped fluid enters rotor chamber; no shaft sealing device required.

Approved by Underwriters' Laboratories. Available in wide choice of materials . . . from ⅓ to 7½ hp. Capacities to 250 gpm. Heads to 195 feet.

Chempump can't leak!

Gold plating tolerances at Western Electric's Allentown, Pa. plant are appreciably closer than in most precision plating operations. Holding these tolerances requires frequent checks on bath composition, and careful filtering and agitation of the plating solution. Selection of a leak-proof *Chempump* for this gold plating operation solves several problems. Since *Chempump* has no seals, no stuffing box, there can be no leakage of costly gold solution. Absence of any packing or other internal lubricants means complete freedom from plating solution contamination, which would seriously impair plating uniformity and product quality.

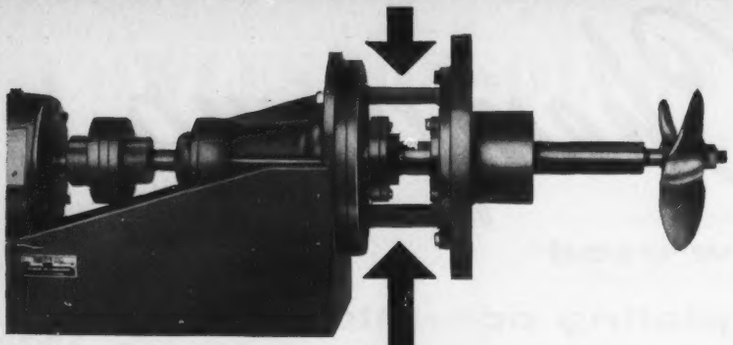
The *Chempump* runs 16 hours a day, 5 days a week. Every four months the rear bearing is replaced; the front bearing, much less often. The job takes about 20 minutes. *No other maintenance is required!*

Your process, too, can benefit with *Chempump*—the seal-less centrifugal pump that can't leak. Send for new 16 page Bulletin 1010 and get the details. Chempump Corporation, 1300 E. Mermaid Lane, Philadelphia 18, Pa.

Engineering representatives in over 30 principal cities in the United States and Canada.

Chempump —first in the field...process-proved

When inquiring check CP 8262 opposite last page

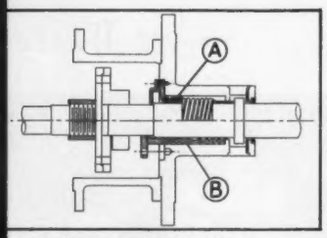




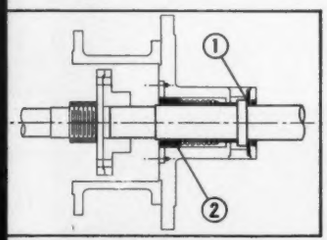
THIS MIXER'S A MAINTENANCE MISER

Nettco Side Drive Mixers are now available with mechanical shaft seals of unsurpassed lasting qualities. The Nettco design permits seal inspection or service under full pressure . . . without draining storage tanks or other time-consuming preparations. The seal service operation is simple, quick, inexpensive. If repair parts are not available, the complete assembly can be replaced by a conventional stuffing box. *Only Nettco offers this feature!*

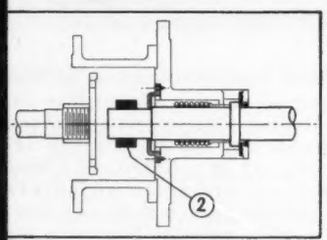
Nettco Side Drive Mixers with the "maintenance-miser" seal are available in ⅓ to 30 HP sizes . . . in many arrangements and alloys to suit specific job requirements. Next time check Nettco — for prices and recommendations. New England Tank & Tower Co., 93 Tileston Street, Everett 49, Massachusetts.



Seal arrangement showing interchangeability of mechanical seal (A) and conventional stuffing box (B).



Mechanical seal isolated from tank pressure by secondary shut-off collar 1, with seal parts 2, exposed for inspection.



Seal in open position with split flange coupling removed for repair or replacement of seal parts 2.

Send for new Side Drive Bulletin #532.

NETTCO
ENGINEERED AGITATION

When inquiring check CP 8263 opposite last page

Lower maintenance cost with belt-driven exhaust fan

In addition to its lower price advantage, belt-driven exhaust fan recently announced by manufacturer reduces installation and maintenance costs. It is designed to accommodate any standard motor of proper rating.

Fan unit is available in a range of sizes from 12 through 48" diameter, with capacities from 900 to 38,000 cfm. It is suitable for operation against static pressures up to 1½" water. Design features include non-sparking, non-corrosive, solid cast aluminum blade, sealed ball bearings, adjustable motor mount support.

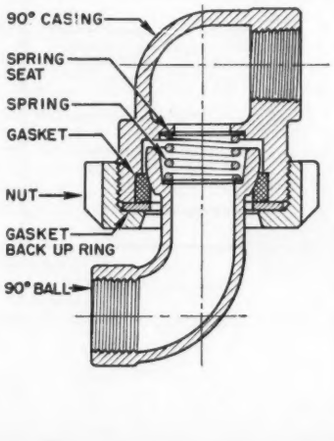
(Series R exhaust fans are products of M & E Manufacturing Co., Dept. CP, 2571 Winthrop Ave., Indianapolis 5, Ind. . . . or for more information check CP 8264 on handy form opposite last page.)

Self-aligning design speeds installation of swivel joint . . .

handle pressures to 2000 psi

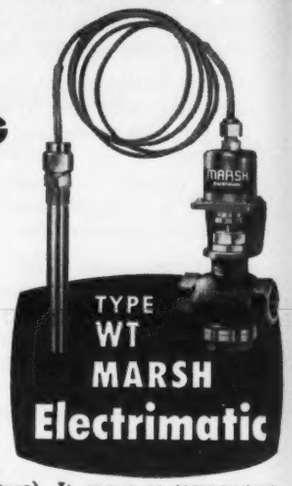
Uses: To provide movement in metal piping connected to moving or movable machinery.

Features: Units have self-aligning design which simplifies and speeds up pipe fitting and automatically eliminates binding and guards against wear.



MARSH QUALITY

. . . in a Temperature-actuated
REGULATING VALVE



Smooth, modulating control
- *— for brine lines in cooling systems*
- *— for condensers where pressure line is not desired*

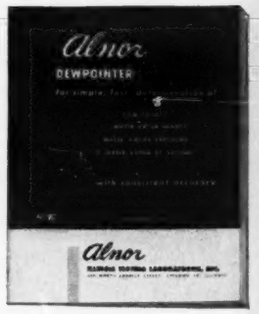
A temperature actuated regulating valve you can depend on—the Marsh Electrimatic Type WT for pressures up to 150 psi, water or brine, and up to 15 lbs. for steam (250° maximum temperature). It opens as temperature rises, closes as temperature falls, to give an ideal, smooth, modulated control. Can be mounted in any position; serviced without breaking connections. Seat beads are monel to eliminate wire drawing. Sturdy, two-ply bellows assures extra service life. Temperature ranges of 20°F.-60°F.; 60-100, 100-140, 140-180, 160-220. All standard sizes from ⅜" through 4". All styles of temperature bulbs.

Ask for latest data

MARSH INSTRUMENT CO. *Sales Affiliate of Jas. P. Marsh Corp.* Dpt. Z, Skokie, Ill. Marsh Instrument & Valve Co. (Canada) Ltd., 8407 103rd Street, Edmonton, Alberta, Canada

When inquiring check CP 8265 opposite last page

get this
free
INFORMATIVE BULLETIN



Learn how easy it is for anyone to determine dew points quickly and accurately with the
ALNOR DEWPOINTER!

Only the Alnor Dewpointer has a sealed testing chamber, where atmospheres can be analyzed under controlled conditions . . . where the fog is observed *suspended in air* for fast, positive readings. Completely self-contained and readily portable for laboratory accuracy anywhere in the plant or field. And simple, direct operation enables even nontechnical personnel to easily obtain precise results, time after time.

Tear out this ad and send it along with your business letterhead to Illinois Testing Laboratories, Room 504, 420 N. LaSalle St., Chicago 10, Ill.

Alnor

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 8266 opposite last page

Description: Swivel joints are available in a complete range of sizes from ½ to 2″ in four styles for high pressures and/or high temperatures. All stock sizes have malleable iron casing and steel ball; sizes 1½ and 2″ have steel nut and can also be furnished in all-steel construction.

When equipped with all-metal gaskets, the 1½ and 2″ sizes are suitable for working pressures to 2000 psi and are recommended for hydraulic applications where protection against blow-outs is essential.

(Swivel joints, Series 600 Type S, are products of Dept. J-13, Barco Manufacturing Co., Dept. CP, 500 N. Hough St., Barrington, Ill. . . . or for more information check CP 8267 opposite last page.)

Prevents back-spinning in vertical turbine pumps . . .

non-reverse ratchet locks within 1/72 of a revolution

Uses: Driving vertical turbine pumps.

Features: For positive protection against damage in backspin, a ball-type, non-reverse ratchet in motor locks within 1/72 of a revolution and physically prevents motor and pump from rotating in reverse.

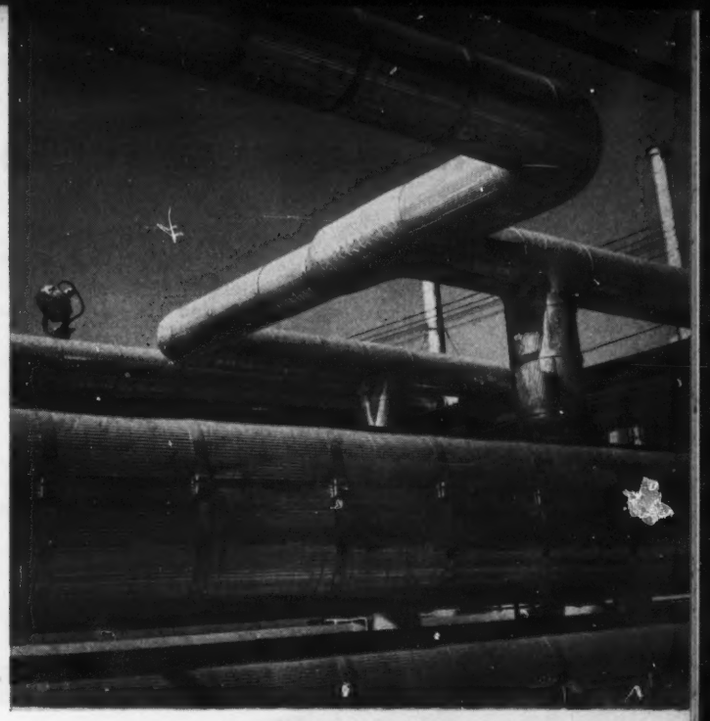
Description: Non-reverse ratchet is being offered on company's motors up to and including 200 hp. Ratchet element is always stationary, while ball retainer rotates with motor.

(Vertical hollow-shaft electric pump motors with Bal-lok non-reverse ratchets are products of ACEC Electric Corporation, Dept. CP, 40 East 49th St., New York 17, N. Y. . . . or check CP 8268 opposite last page.)

For more information on product at right, specify CP 8269 . . . see information request blank opposite last page.

How Olin Mathieson Uses Childers Jacketing For Insulated Lines

Jacketing problems at new plant ranged from covering tall towers to irregularly-shaped heat exchangers. Read how aluminum jacketing solved these problems.



More than 244,000 square feet of Childers .006″ Jacketing and 35,000 square feet of heavy weight Childers Jacketing was used in this new Olin Mathieson plant to weatherproof insulated lines, towers and vessels. Close-up above shows how aluminum jacketing was applied with strapping and seals.

Low first-cost, long life, and easy installation were the big reasons Olin Mathieson Chemical Corporation used Childers Aluminum Jacketing for outdoor insulated lines in their new Brandenburg, Ky., petrochemical plant.

Mathieson used Childers standard weight Jacketing on their insulated lines. Heavier weights of Childers Jacketing were used on high towers and vessels where a stiffer material was needed to support the vertical weight of the jacketing.

Engineers report that Childers Jacketing is inexpensive to apply. It comes in easy-to-handle rolls 4 ft. wide and 100 ft. long. Just pliers and a pocketknife are the only tools needed to apply. And because the jacketing is aluminum it needs no painting . . . stays clean and new looking even after years of service.

Childers Jacketing is easily removable, too. Just remove the strapping and jacketing can be taken off for inspection of the lines. Then same jacketing can easily be put back on the insulated line.

Immediate shipment from our large factory stocks can eliminate costly delays in construction or plant improvement schedules.

Try this low-cost protection in your plant. Write today for engineering data and information. You can order a 400 sq. ft. roll to test on one of your insulated lines. No obligation. Address: Childers Manufacturing Company, Department LP-11, 3620 West 11th St., Houston, Texas.

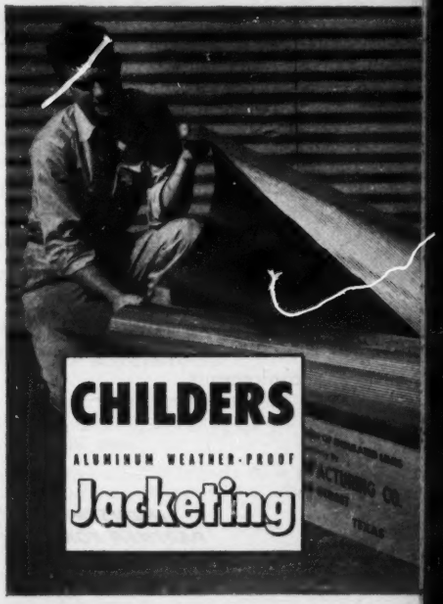
How to apply Childers Jacketing:



1. Best method of attaching jacketing is aluminum strapping and seals. Strapping can be pulled plenty tight with pliers like this. Other method is to use sheet metal screws.



2. A two-man crew can apply jacketing fastest. No special shop work or roll forming is necessary. Only tools needed are a pliers and a screw-driver or wooden wedge.



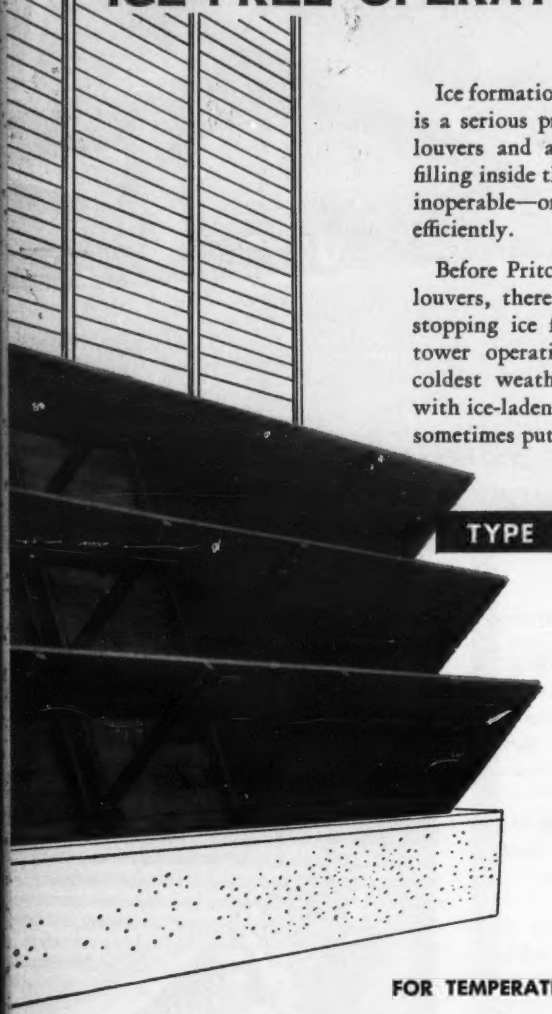
Each roll of Childers Jacketing comes individually packed like this in a heavy corrugated carton. Rolls are 4 ft. wide. With moisture barrier attached they are 100 ft. long; without moisture barrier they are 200 ft. long. They are well protected for field storage if kept dry. Individual boxes are light enough for one man to handle. (Adv.)

PRITCHARD LOUVERS MAKE POSSIBLE ICE-FREE OPERATION IN COLDEST CLIMATES!

Ice formation on cooling tower louvers is a serious problem. Ice can break the louvers and also seriously damage the filling inside the tower. The tower is left inoperable—or, at best, operating inefficiently.

Before Pritchard developed Type WX louvers, there was no effective way of stopping ice formation or keeping the tower operating at peak efficiency in coldest weather. Operators of towers with ice-laden louvers shut off the fans—sometimes putting a canopy over the fan throat—in an effort to melt the ice. But the most they could accomplish was to prevent a further accumulation of ice. And often they couldn't prevent this. Then they tried reversing the flow of air through the tower. This did a partial job of getting rid of ice but also involved the purchase of costly reverse starters for the fan motors.

Now ice formation can be stopped before it starts—with the Pritchard Type WX louvers. One more reason to choose Pritchard!



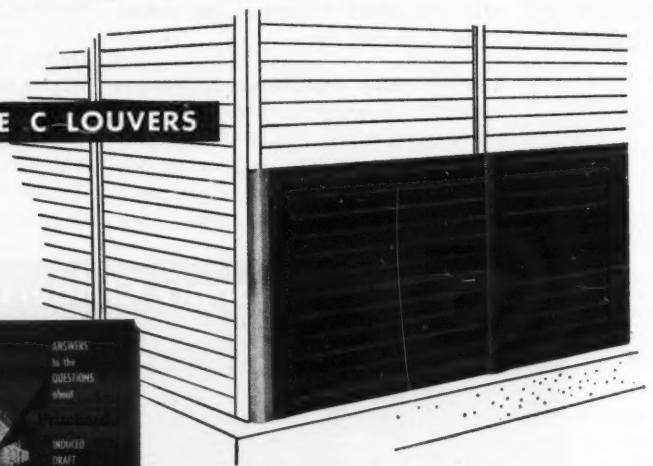
TYPE WX LOUVERS

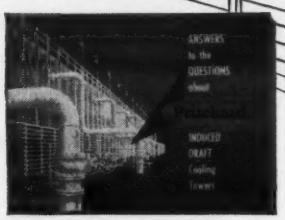
Especially designed to eliminate ice formation in extremely cold weather operation. Wide louvers are supported in a frame set out from the tower to prevent splashing water from reaching the louvers and forming ice. Each louver is individually hinged, can be opened or closed to regulate air flow into the tower, thus controlling water temperature and stopping ice formation. The WX louvers can be shut off on the windward side, leaving the louvers on the other side open. In this way the tower can continue to function efficiently without danger of freezing. The entire operation can be done from the ground, adding safety and convenience.

TYPE C LOUVERS

FOR TEMPERATE CLIMATES

Louver boards are set at an angle on close centers vertically and are supported by slotted louver posts set close to the tower. All boards are individually removable for easy access to the basin. This design makes possible a neat, compact tower with minimum basin requirements.





NEW PRITCHARD INDUCED DRAFT COOLING TOWER BROCHURE

This new Pritchard brochure answers 15 questions about Pritchard Induced Draft Cooling Towers. Completely illustrated. Each feature described in detail. Large, cutaway drawing takes you inside a typical Pritchard tower. Interesting, informative. Send for your complimentary copy today on your company letterhead!

INDUSTRY'S PARTNER FOR PROGRESS

COOLING TOWERS
GAS & AIR TREATING EQUIPMENT

REPRESENTATIVES IN PRINCIPAL CITIES FROM COAST TO COAST

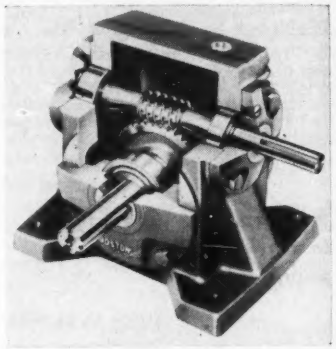
J.F. Pritchard & Co.
OF CALIFORNIA
A DIVISION OF J. F. PRITCHARD & CO.
Dept. 459, 4625 Roanoke Parkway, Kansas City 12, Mo.

Improved gearing of drive provides more capacity in less space

Uses: For speed-reduction.

Features: Compact design and improved worm gearing of unit provide greater load carrying capacity with less weight in less space.

Combination construction permits removal of motor at any time without disturbing gear reduction unit. Original motor may be easily replaced with one of special characteristics.



Gear reduction units are available with ratios from 10:1 to 3600:1

Description: Motorized gear reduction units are available in 28 standard stock models — 194 different motorized units, with general-purpose of totally-enclosed motors in 13 different sizes from 1/6 to 10 hp, with various voltages.

Flanged reductors (gear units less motors) are available in the same ranges, with ratios from 10:1 to 3600:1, and output torque ratings from 50 in-lb to 9400 in-lb.

(100 Series Ratiomotors and 100 Series flanged reductors are products of Boston Gear Works, Dept. CP, 113 Hayward St., Quincy 71, Mass. . . . or for more information check CP 8270 on handy form opposite last page.)

For more information on product at left, specify CP 8271 . . . see information request blank opposite last page.

Separates dust from air with water and cyclonic action, dries air before discharge

Uses: Industrial dust and fume collection applications.

Features: During operation of unit, dust and fume laden air is in continuous fluid contact during upward flow. Baffle design sets up a cyclonic washing action and turbulence, separating wet dust and carrying it to sludge tank below. Saturated air continues up through two-stage moisture eliminator and emerges completely dry.

Description: Dust and fume collector consists of a cylindrical drum with a series of cones and baffles. Water, supplied by direct driven pump, cascades downward within collector. This action produces a series of closely related water curtains through which dust-laden air is filtered in its upward travel. Double row of moisture eliminators, fabricated in convenient handling size, are mounted above washing chamber. Access doors are provided in housing for inspection of eliminators and wash chamber.

Design of unit incorporates a flat bottom which serves as a settling tank from which water is recirculated. A "chute" clean-out is provided for easy hand clean-out.

(Wet-type dust and fume collector is a product of Van-Truer Company, Inc., Dept. CP, 12600 Beech Road, Detroit 23, Michigan . . . or for more information check CP 8272 opposite last page.)

Aerosol helps water spray do grease-removal job . . .

sprayed on and easily washed off, remover takes grease with it

Uses: Cleaning heavy deposits of grease and oil from engines, other machinery.

Features: Remover is packaged in an aerosol can. After unwanted deposits have been softened and loosened with the aerosol spray, they may be flushed clean with fresh or salt water.

Description: Product contains no acids or alkalis which might harm metal surfaces. It can also be used to remove both oily and water-soluble soil from painted surfaces. Advantage lies in time-saving convenience of application from a pushbutton, self-spraying container.

DuPont "Freon" fluorinated hydrocarbon propellent is used to provide dispensing pressure in the aerosol product.

("Swish" aerosol motor cleaner and degreaser is a product of Montgomery Chemical Company, Dept. CP, Jenkintown, Pa. . . . or for more information check CP 8273 on handy form opposite last page.)

Material: Activator solution—water with 5% ferro-sulphate.

Problem: Short service life of turbine pumps; sometimes only two weeks.

Solution: First Moyno ran 6 months without a breakdown. Using relief valves, pressure is kept at constant 120 p.s.i. Now using 7 Moynos because of this exceptional service.

Material: Anti-scale boiler treatment. (Alcohols, oils, anti-foam agents, sludge conditioners.)

Problem: Frequent pump breakdowns caused by back pressure of spray nozzles; and abrasion.

Solution: Moyno pumps cut pumping time from 20 minutes to 3, reduced down-time, increased production 200%!

Material: Caustic solution—for use in mercerizing machines.

Problem: Rotary pumps wore quickly; lost capacity, and did not have enough suction.

Solution: Moyno pumps cut maintenance and repairs to minimum—had ample suction for drawing caustic through the cloth.

Material: 40° copperas crystals in 20% sulphuric acid.

Problem: Low production of diaphragm pump.

Solution: Moyno pump handles an increased percentage of solids, which in turn increases production.

Material: Calcium carbonate slurry.

Problem: Continuous failures of centrifugal pumps.

Solution: Moyno pump still giving perfect service after 1½ years. Service is practically continuous—with pump in operation 24 hours per day.

Material: Size—containing china clay and latex.

Problem: Centrifugals unable to handle viscosity—causing frequent trouble.

Solution: Moyno pump has been on duty for a year. Pump trouble completely eliminated; no repairs required.

Six Chemicals-Handling Problems... Solved by the MOYNO® PUMP!

Features of the MOYNO that may solve YOUR pumping problem

Positive Displacement—Moynos are available to pull up to 29" vacuum while discharging under pressure. Big Moynos deliver up to 250 g.p.m. at pressures to 600 p.s.i.

Gentle—No churning; won't break up semi-solids; won't aerate liquids.

Reversible—The Moyno pumps with equal efficiency in either direction.

Versatile—handles liquids, abrasive slurries, pastes—even potato salad! Rotor and stator are available in stainless steel, other alloys or plastics to meet a wide variety of applications.



Trouble-Free—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

Looking for a pump with a fast-growing reputation for solving tough pumping problems? Then take a look at the simple, versatile Moyno!

Briefly described above are a few of the many successful case histories proving how Moynos handle jobs where other pumps fail. Why is the Moyno a "problem-solving" pump? For one thing, because it differs completely from conventional pumps . . . rotary, centrifugal or piston. Just one rugged moving part—a rotor turning within a stator—does the job.

The list of chemicals handled by Moynos gets longer every day. If *you* have a pumping problem, such as handling abrasive slurries, mild acids, caustics—watery, viscous or even semi-solid—find out if the Moyno can help you! Use the coupon below for prompt, complete information.

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Fractional & Integral h.p. Motors & Generators | Electric Fans | Electric & Hand Hoists & Cranes | Moyno Pumps | Propellair Industrial Ventilating Equipment

Robbins & Myers, Inc. CP
Pump Division, Springfield 99, Ohio

Gentlemen: Please mail free copy of Bulletin 30-B containing details on construction and operation of Moyno Pumps:

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

When inquiring check CP 8274 opposite last page



When inquiring check CP 8275 opposite last page

new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

Silicone protective coatings control corrosion

Five-page technical data sheet covers uses, properties, and application procedures for coatings formulated from a water solution of sodium methyl siliconate. When applied to a variety of materials, such as concrete, gypsum, and certain other materials of construction, product produces an invisible, water-repellent, protective coating.

Data Sheet SC-50 is available from Silicone Products Dept., General Electric Company, Dept. CP, Waterford, N.Y. When inquiring specify CP 8276 on handy form opposite last page.

Barium products handbook

Devoted specifically to barium alkalis, spiral-bound 24-page handbook outlines manufacturing operations and describes available products. These include barium peroxide, oxide, pentahydrate, octahydrate, nitrate, carbonate, sulfide, and the sulfates (blanc fixe and heavy spar). Handling precautions are outlined.

"Barium Products" is issued by Westvaco Mineral Products Div., Food Machinery & Chemical Corp., Dept. CP 161 E. 42nd St., New York 17, N.Y. When inquiring specify CP 8277 on handy form opposite last page.

Heavy-duty, corrosion-resistant process pumps are described

Series H Durcopump is subject of four-page data folder. Designed as a heavy-duty process pump to handle high heads at most capacity ranges at normal or elevated temp, it is available in complate range of Durco machineable alloys. Bulletin shows simple design and rugged construction.

Bul P/8 is issued by The Duriron Co., Inc., Dept. CP, Box 1019, Dayton 1, Ohio. When inquiring specify CP 8278 on handy form which is located opposite last page.

Properties, applications of stainless brazing

Four-page folder describes Nicrobraz, a stainless steel brazing alloy. Properties, strengths, applications of the brazing alloy are given. Also covered are special facilities of manufacturer for research and production work.

Form SD-21 is available from Stainless Processing Div., Wall Colmonoy Corp., Dept. CP, 19345 John R St., Detroit 3, Mich. When inquiring specify CP 8280 on handy form opp. last page.

Details construction, design of butterfly valves

Describing rubber-seat butterfly valves, four-page bulletin shows dimension prints of four valves ranging 16 to 30 inches in size. Description of valve components is included. Operator types are manual lever, chainwheel, electric motor, air motor, hydraulic cylinder, air cylinder, diaphragm motor.

Bulletin 650-L1 is issued by Builders-Providence, Inc., Div. B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R.I. When inquiring specify CP 8281 opposite last page.

Tells how one electrical tape does work of two

Advantages of the application of one electrical tape to do the work of two are discussed in four-page illustrated brochure. Table of technical data is supplied, illustrating curing cycle, tensile strength, and seven other pertinent factors relating to backing of these tapes which are composed of various materials ranging from glass cloth to crepe paper.

"Permacel 2 in 1 Electrical Tapes" is available from Permacel Tape Corporation, Dept. CP, Highway 25, New Brunswick, N. J. When inquiring specify CP 8282 opposite last page.

Catalogs industrial hose assemblies

Industrial hose assemblies, couplings, stems, swivels, and accessories are presented in 24-page catalog. Description, specifications and engineering data are included.

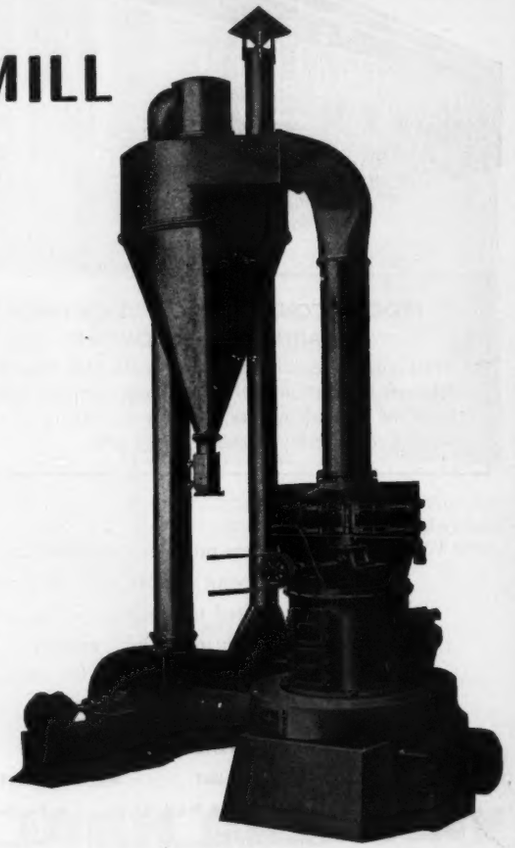
Cat 55 is available from J. N. Fauver Company, Inc., Dept. CP, 51 W. Hancock, Detroit 1, Michigan. When inquiring specify CP 8283 on handy form opposite last page.

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EVEN DISPERSION
LOW OIL ABSORPTION
TINTING QUALITY
COVERING POWER

RAYMOND ROLLER MILL



Manufacturers of colors, fillers and similar materials are able to improve the quality and marketability of their products by the use of the Raymond Whizzer Type Roller Mill.

This modern machine produces an extremely fine and uniform powder up to a fineness of 99.99% passing 325-mesh. It is used for making high grades of mineral paint materials, including white lead, lithopone and titanium pigments—also finely ground fillers, such as limestone, barytes, clays, natural and synthetic chalks.

The Whizzer air separator on this mill gives close control over the fineness of product and yields greatly increased output. One simple adjustment, while the mill is running, permits easy regulation in classifying the product.

Production costs are low with the Raymond Roller Mill due to its economy in operation and maintenance, as well as the automatic handling of the material from feeder to finish bin without dust or waste.

Refer your grinding problem to Raymond engineers—for further details, write for Catalog No. 79

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Raymond Division

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When inquiring check CP 8284 opposite last page

More Profits

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- Flexibility of Operation
- Guaranteed Product Quality



PROCTOR CONTINUOUS CONVEYOR DRYER AT NATIONAL YEAST COMPANY

Yeast requires sensitive drying methods. This Proctor & Schwartz installation at National Yeast Company maintains the uniform quality, color, and viability of the yeast at considerably increased drying rates.

Proctor equipment provides the control and flexibility essential to profitable drying performance. Many wet-solid materials heretofore unsuited to conveyor drying can now be handled with speed and efficiency. And, as with all Proctor equipment, guarantee *is in terms of finished product produced.*

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PROCTOR & SCHWARTZ, Inc.

Manufacturers of Industrial Drying Equipment and Textile Machinery

Philadelphia 20, Pa.

When inquiring check CP 8285 opposite last page

NEW LITERATURE

Isopropanol booklet

Information on uses, properties, specs, shipping data, and constant-boiling mixtures of isopropanol are detailed in 16-page booklet. Thirteen graphs accompany text and tables.

Bul F-8731 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 8286 on handy form which is located opposite last page.

Describes how unit checks CO

Data sheet of two pages uses photographs, sketches and text to describe how carbon monoxide detector hides control of carbon monoxide in physiologically significant concentrations. Detector described uses potentiometer to provide and control.

Data Sheet No. 10.15-13 is available from the Industrial Division, Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. When inquiring specify CP 8287 on handy form opposite last page.

Protection of pavement from weeds, grass

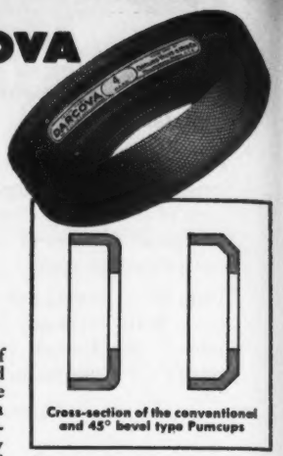
Application of non-poisonous, non-corrosive borate weed killer under asphaltic paving is described in two-page bulletin. This literature augments information on the weed killer which can also be used around buildings, along fence lines, and in other industrial applications.

Bul 2W is issued by American Potash & Chemical Corp., Dept. CP, 99 Park Ave., Los Angeles 54, Calif. When inquiring specify CP 8288 on handy form which is located opposite last page.

TRY DARCOVA PUMCUPS

FOR

- *Higher pump efficiency*
- *Lower pump maintenance*



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IT'S a fact that hundreds of reciprocating pump and cylinder users today are standardizing on Darcova Pumcups because they eliminate fluid slippage, costly down-time and maintenance!

It's easy to check these claims right in your own plant. Behind this exceptional Darcova Pumcup performance lies texture-engineering and cup design that conform precisely to pressure-temperature-fluid conditions.

Pumcups of various types are available in a complete range of sizes and texture-engineered compositions for your reciprocating pump and cylinder requirements.

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DARLING VALVE & MANUFACTURING CO.

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DARCOVA

TRADE MARK PUMCUPS

When inquiring check CP 8289 opposite last page

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POSITIVE PROTECTION FOR PRESSURE SYSTEMS WITH FRANGIBLE DISCS



The Engineered "Safety Factor"

CHECK THESE IMPORTANT FEATURES:

- FULL PIPE SIZE RELIEF OPENING . . . Disc breaks in several lobes without fragmentation.
- VERSATILITY . . . Use FDI discs and assemblies anywhere in your piping system. Made from most metals and supplied with chemical-proof coatings.
- WIDE RANGE OF PRESSURE AND TEMPERATURE PROTECTION . . . Designed to rupture from 5 psi to 5,000 psi or higher on special order.
- LOW MAINTENANCE COSTS . . . No moving parts. Slide the retainer ring out, replace the disc and re-install. Simple, easy and economical.

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Frangible Discs, Inc.

Penns Grove, N. J.

When inquiring check CP 8290 opposite last page

Speeds to 300/min with labeler

High-speed, automatic labeler for precision application of single or multiple labels at speeds to 300 glass containers per minute is described in two-page bulletin. Detailed text is supplemented by pictures of unit.

Bul CM-234 is available from Economic Machinery Co., Div. of Geo. J. Meyer Mfg. Co., Dept. CP, 40 Fremont Street, Worcester 3, Mass. When inquiring specify CP 8291 on handy form opposite last page.

Colloidal silica for plastics

Bulletin CPla-1 shows how Cab-O-Sil colloidal silica is used in polyester/glass-reinforced plastics. Four pages, two graphs. Bul CPla-2 describes the silica itself. Recommends use in plastics as a thixotropic, thickening, gelling, and antiblocking agent. Eight pages, three graphs.

Both are issued by White Pigments Div., Godfrey L. Cabot, Inc., Dept. CP, 77 Franklin St., Boston 10, Mass. When inquiring specify CP 8292 on handy form opposite last page.

Details on welding electrodes for chrome-moly steels

Characteristics, applications, and physical properties of chrome-moly electrodes for welding corrosion-resistant chromium molybdenum alloy steels are presented in 13-page bulletin. Charts, tables, and comparison curves supplement text.

Bul CM-55 is available from Champion Rivet Co., Dept. CP, 10931 Harvard Ave., Cleveland 5, Ohio. When inquiring specify CP 8293 on handy form opposite last page.

Procedure for reinforced plastic tooling

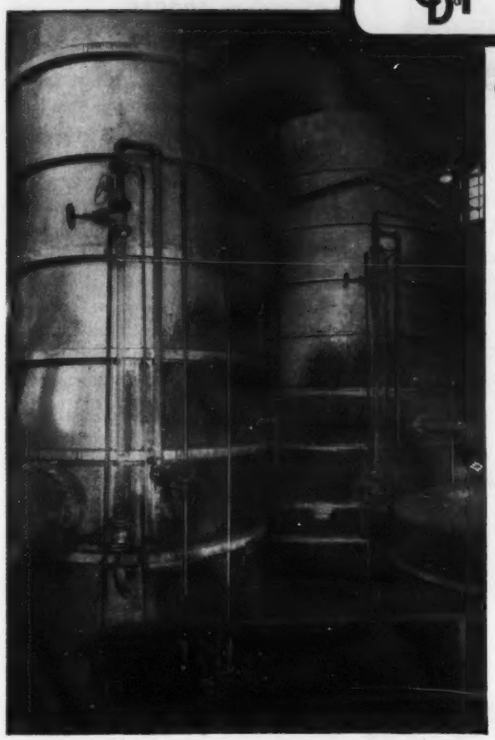
Illustrated with perspective drawings and photographs, 16-page manual describes in detail procedure for reinforced plastic tooling. Equipment, materials, and suppliers are covered.

"A manual for Reinforced Plastic Tooling" is issued by The Marblette Corp., Dept. CP, 37-21 30th St., Long Island City 1, N.Y. When inquiring specify CP 8294 on handy form opposite last page.

CB&I

FORMULA

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Conkey all nickel construction Triple Effect Evaporator producing 50 per cent caustic liquor.

Conkey Crystallizers, Evaporators and Filters

Here is your prescription to remedy crystallizing, evaporating and filtering problems . . . Conkey designed and engineered equipment, fabricated in Chicago Bridge & Iron Company's four strategically located shops, and erected by CB&I experienced crews.

If your plant has a filtering, evaporating or crystallizing problem, write our nearest office. A Conkey engineer will be happy to assist with information, estimates or quotations.



Conkey Triple Effect Vacuum Crystallizer producing ammonium sulphate.



Conkey Rotary Hopper Dewaterer in service dewatering abrasive grains.

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When inquiring check CP 8295 opposite last page

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DURAMETALLIC is ready to help you with those stuffing box problems . . . we've been doing it for industry for 38 years. Experienced factory-trained sales and service engineers are located in all sections of the U.S.A.

Without charge, a staff of research and development engineers at our Kalamazoo plant are ready to help you with your sealing needs.

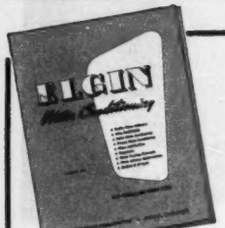
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OTHER WATER CONDITIONING EQUIPMENT

This 20-page book which describes today's newest types of water conditioning equipment will be of real interest to you. It covers water softeners, deionizers, dealkalizers, filters, other water conditioning equipment, and water treating chemicals —all designed to increase production and cut costs.

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(If desired, we will have our nearest representative get in touch with you)

ELGIN SOFTENER CORPORATION

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When inquiring check CP 8297 opposite last page

To get more information on products—use the Reader Service slip • *opposite last page*

NEW LITERATURE

For temps to 1200°F, a molded insulation

Molded insulation, using calcium hydrous silicate, is made to withstand temperatures up to 1200°F on industrial process lines and distributional steam lines. Four-page bulletin discusses advantages of insulation, gives its physical properties, and tabulates packing data. Insulation discussed is made in a full line of preformed semi-cylindrical sectional pipe coverings, to fit ½ to 18" pipe sizes.

Bulletin on Tri-Calite insulation is available from Insulation Division, Mundet Cork Corporation, Dept. CP, 7203 Tonnelle Ave., North Bergen, N. J. When inquiring specify CP 8298 on handy form opposite last page.

Research chemicals of animal origin

Twenty-seven experimental chemicals of animal origin are listed in six-page hand-size folder. Prepared in small quantities for research use, the chemicals include animal blood products, fatty acids and their derivatives, and the enzyme catalase.

Cat No. 7 is issued by Research Div., Armour & Co., Dept. CP, Chicago 9, Ill. When inquiring specify CP 8299 on handy form opposite last page.

Describes petroleum wax for antichecking rubber

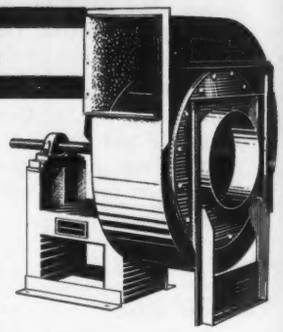
Three-page technical bulletin describes Anti-Check petroleum wax that prevents surface checking and cracking of rubber products. A primary product, wax offers many advantages.

Bul No. 30 is issued by Sun Oil Co., Dept. CP, 1608 Walnut St., Philadelphia 3, Pa. When inquiring specify CP 8300 on handy form opposite last page.

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For All Air Handling Jobs
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Dracco Industrial Fans—"Performance Proved" by 15 years' use with Dracco Dust Control systems—give longer, trouble-free service. Superior construction—welded, vibration-free, all steel elements, no castings to crack, precisely balanced, Rotation and discharge adjustable. Wide range of sizes—inlet diameters 11"-38", pressures to 17" S.P., volumes from 500-46,000 CFM. For better performance, specify Dracco Fans. For details, contact:

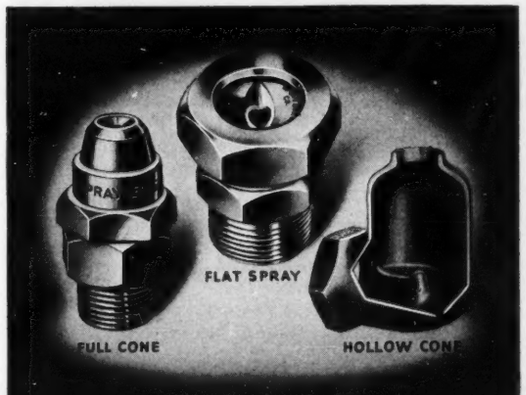


Write for 40-page Dracco Fan Bulletin No. 601 containing complete performance data and specifications.

DRACCO CORPORATION

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CLEVELAND 5, OHIO

When inquiring check CP 8301 opposite last page



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Write for NOZZLE CATALOG *to*

SPRAY ENGINEERING CO.

125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 8302 opposite last page

Boiler scale and corrosion — how to control it

Importance of controlling boiler scale and corrosion is stressed in four-page folder. Manufacturer's services are described in "How to Control Scale and Corrosion in Your Boiler" issued by Wright Chemical Corp., Dept. CP, 627 W. Lake St., Chicago 6, Ill. When inquiring specify CP 8303 on handy form opposite last page.

Complete line of timers for process control

Nine timers, two automatic transfer switches, magnetic contactors, and automatic reversing controls are described in eight-page booklet. Capacity of most timers is 1000 watts. Specific timers are suggested for 24-hour and seven-day programming, multiple circuit control, process timing, interval and remote control timing.

"Supplementary Listings" is issued by Zenith Electric Company, Dept. CPC, 152 W. Walton St., Chicago 10, Ill. When inquiring check CP 8304 on handy form opposite last page.

Shows multi-well controls for natural gas

Outlining control systems for low-pressure stripping of natural gas, two-page bulletin shows schematic of four-well control system. Installation economies attained using one controller are discussed.

AED 132-7 is issued by the Foxboro Company, Dept. CP, 174 Neponset Ave., Foxboro, Mass. When inquiring check CP 8305 opp. last page.

Compressor features shown

Gas-engine-driven compressors in the 330- to 660-hp range are subject of 44-page bulletin. Important details of units are pointed out on cross-section drawings and a special cross-section in five colors traces paths of fuel, exhaust gases, lubricating oil, cooling water, and gas being compressed. Special sections cover specifications, dimensions, and data.

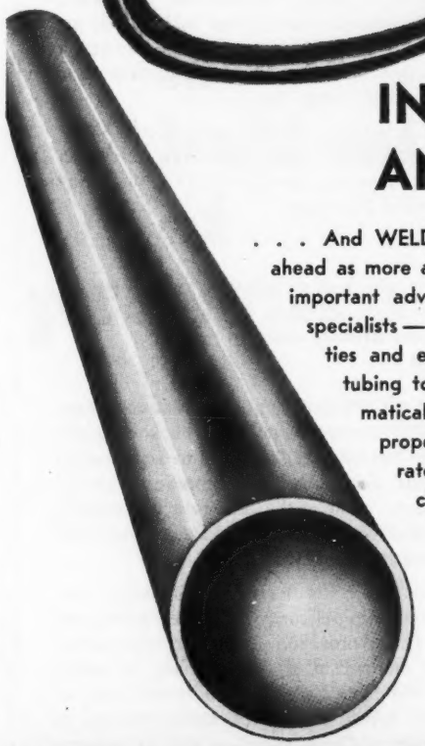
Ten pages of photographs show compressors at work in oil fields, natural gas service, refineries, gasoline plants, and in industrial applications.

Form 3128-A is available from Ingersoll-Rand Company, Dept. CP, 11 Broadway, New York 4, N. Y. Specify CP 8306 opposite last page.



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. . . And WELDCO Tubular Products keep moving ahead as more and more buyers discover their many important advantages. WELDCO is produced by specialists — men who have the equipment, facilities and experience to manufacture pipe and tubing to your exact specifications. It's automatically machine-welded under pressure, properly formed, carefully finished, accurately sized and straightened, and rigidly checked. And remember, too, only WELDCO is welded with the exclusive Double-Fusion Process. . . . It's available in Stainless Steel, Monel, Inconel, Nickel, Cupro-Nickel, and Hastelloy, in tube and pipe sizes from 3" to 30", Schedules 5 and 10, and 3" to 12", Schedule 40. To get lightweight, corrosion-resistant Tubing with complete uniformity and long service life, always specify WELDCO — your best buy in top-quality tubing.



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You're 'Way Ahead With WELDCO

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When inquiring check CP 8307 opposite last page



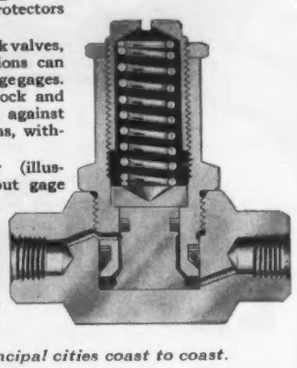
SAFEGUARD YOUR GAGES WITH REPUBLIC PROTECTORS

PROTECT your expensive gages from damage with Republic Gage Protectors and Pressure Snubbers.

Fluid hammer, chattering check valves, and severe pressure fluctuations can cause extreme shock, and damage gages. Pressure Snubbers absorb shock and permanently protect gages against damage from wild fluctuations, without affecting accuracy.

Adjustable Gage Protector (illustrated) automatically cuts out gage when system pressure rises above gage range, and reopens when pressure drops. Working pressures to 10,000 psi.

Ask for Gage Protector Bulletin No. 554, or new catalog No. 654 showing entire line.

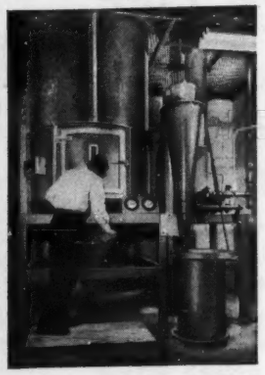


Distributors in principal cities coast to coast.



RM REPUBLIC MANUFACTURING CO.
15655 BROOKPARK ROAD • CLEVELAND 11, OHIO

When inquiring check CP 8308 opposite last page



NEW BOWEN SEMI-WORKS SPRAY DRYER

★ COMPACT
★ HIGH YIELD
★ EASY TO CLEAN
★ LOW OPERATING COSTS

● **At last a fully prefabricated spray dryer requiring only hours to erect.** The new reasonably priced Bowen Semi-Works Spray Dryer makes available a small, compact unit requiring a working area of only 7 x 9 feet, completely prefabricated and transportable through usual factory openings. Surfaces in contact with the product and feed material are of stainless steel thruout. Drying temperatures are variable between 200°F and 750°F to accomodate a wide variety of materials.

An interesting illustrated booklet, Bulletin 36, is available. Send for it today.

BOWEN SPRAY DRYERS Always Offer You More!

BOWEN ENGINEERING INC.
North Branch 1, N. J.

When inquiring check CP 8309 opposite last page

NEW LITERATURE

Explains electron microscope, suggests applications

Including virtually complete specifications on two models, 22-page booklet in two colors explains operation of electron microscope. Typical applications are suggested. Eight electron micrographs are included showing application in metallurgy, virus research, chemical processing, battery research, production control.

Bul 3R2546 is issued by Scientific Instruments, Building 15-1, Engineering Products Division, Radio Corporation of America, Dept. CP, 17th and Cooper, Camden, N. J. When inquiring specify CP 8310 on handy form which is located opposite last page.

Helpful chart lists causes of pump trouble

Over 25 possible mechanical and chemical trouble symptoms in rotary displacement pumps are detailed in helpful chart. Also included is an explanation of how and where chart applies and a brief description of types of equipment that fall into rotary pump class.

Bul PT is available from Eco Engineering Company, Dept. CP, 12 New York Ave., Newark, N.J. When inquiring specify CP 8311 on handy form opposite last page.

Comments on atomic energy act of 1954

Subtitled "A Commentary on the Atomic Energy Act of 1954", recently-published book examines steps taken by Congress to provide legal means for industrial development of the peaceful use of atomic energy, while at the same time maintaining governmental control necessary for national defense, public health, and safety.

Authors discuss in detail system of licensing, control of information, security clearances, patent and power policies, provision for government assistance, and mechanism of foreign trade in atomic facilities and materials. They point out areas of uncertainty which will be of major concern to Atomic Energy Commission — and to industry and its financial and legal counsel.

To obtain "Framework for Atomic Industry" remit $12.50 direct to BNA, Inc., a division of The Bureau of National Affairs, Inc., Dept. CP, 1231 24th St. NW, Washington 7, D. C. When inquiring specify CP 8312 on handy form opposite last page.



What's a "New Solution"?

It's an article in CHEMICAL PROCESSING describing a new way of solving a tough plant operating problem.

In each issue you will find specific "case histories" showing how these processing problems were solved.

Each article states the operating problem . . . explains the process used and gives details of how problem *was solved* . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

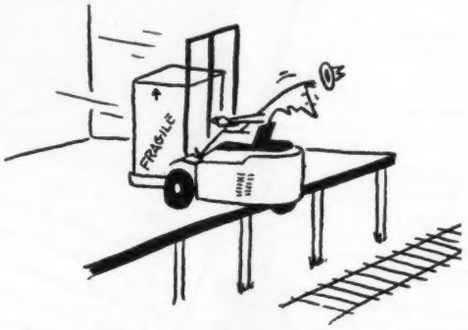
Complex analyses a problem? Try automatic recording

Describing how to automatically record spectroscopic analytical data within one and one-half minutes, 20-page two-color bulletin includes circuit diagrams. Even the most complex analysis, it is mentioned, can be recorded in 12 minutes. Actual-size absorption spectra run on benzene vapor, chloroform, and didymium glass in 45 seconds to 4½ minutes are reproduced. An instrument to release professional personnel from routine work, the unit can be applied to paints, petroleum, paper, rubber, pharmaceuticals.

Spectrocord Bul FS-245 can be obtained from the Fisher Scientific Company, Dept. 717 Forbes St., Pittsburgh 19, Pa. Specify CP 8315 opp. last pg.

Shows correct methods of driving fork lift-trucks

Booklet of 24 pages uses illustrations, cartoons and simple instructions to show how to best operate lift trucks. Preventive maintenance, safety and



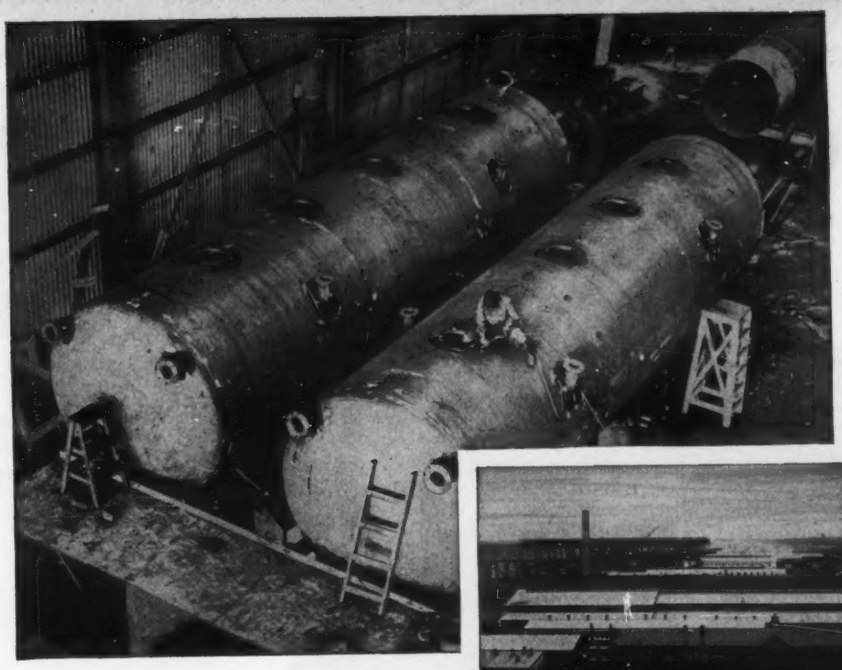
basic materials handling are described. Prepared for use as part of an operator training program, booklet is slated for both beginner and experienced operator.

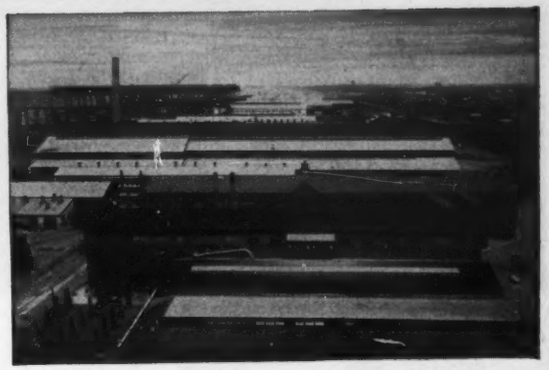
Booklet 1214 is available from Hyster Co., Dept. CP, 2902 N.E. Clackamas St., Portland 8, Oregon. Specify CP 8317 opposite last page.

Filters feature sintered porous bronze

Filters using sintered bronze filter elements are described in illustrated 16-page catalog. Suitable for use with any gas or liquid, units are available for 2, 5, 10, 20, or 40-micron filtration.

"Modern Filtration" is issued by Permanent Filter Corporation, Dept. CP, 1800 West Washington Boulevard, Los Angeles, California. When inquiring specify CP 8318 opposite last page.





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Write to these addresses for more information on conventions and exhibits listed on page 5 of this issue.

American Assn. of Textile Chemists & Colorists, Lowell Textile Institute, Lowell, Mass.

American Institute of Chemical Engineers, 25 W. 45th St., New York, N.Y.

American Chemical Society, 1155 Sixteenth St., N.W., Washington 6, D.C.

The Chemical Market Research Assn., 27 William St., New York 5, N.Y. Mr. Robert Henderson.

25th Exposition of Chemical Industries, c/o International Exposition Co., 480 Lexington Ave., New York 17, N.Y.

Federation of Paint & Varnish Production Clubs, 1524 Chestnut St., Philadelphia 2, Pa., Newell P. Beckwith, President.

Instrument Society of America, 10th Annual Exhibit, Exhibit Manager's Office, 3443 S. Hill St., Los Angeles 7, Calif.

Massachusetts Institute of Technology, Cambridge 39, Mass., Prof. Ernest H. Huntress, Dir. of Summer Session, 1955.

National Petroleum Assn., Munsey Bldg., Washington 4, D.C.

43rd National Safety Congress, c/o National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. R. L. Forney, General Sec'y.

20th Paint Industries Show — contact Federation of Paint & Varnish Production Clubs.

Production Engineering Show, c/o Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N.Y.

Purdue University, Lafayette, Ind., Prof. John M. Cage, Gen. Chm., Conference on Systems Engr.

Technical Assn. of the Pulp & Paper Industry, Sixth TAPPI Testing Conference, 1878 E. 18th St., Cleveland 18, Ohio, Wm. Schoenberg, Exhibition Chm.

Western Electronic Show & Convention, 344 N. La Brea Ave., Los Angeles 36, Calif., Herbert Cerwin, Publicity Director.

Western Plant Maintenance Show, 759 Monadnock Bldg., San Francisco 5, Calif.

World Plastics Fair & Trade Exposition, c/o Consolidated Advertising Directors, Inc., 8762 Holloway Dr., Los Angeles 46, Calif.

PUMP STUFFING BOXES



Fig. 19,488

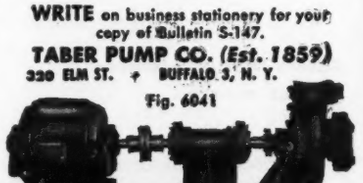
INFORMATION suggesting solution of common stuffing box difficulties; available in newly revised BULLETIN S-147

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WRITE on business stationery for your copy of Bulletin S-147.

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Fig. 6041



TABER

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Discussed in This Issue - - -

PROCESSES, EQUIPMENT and MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to last page and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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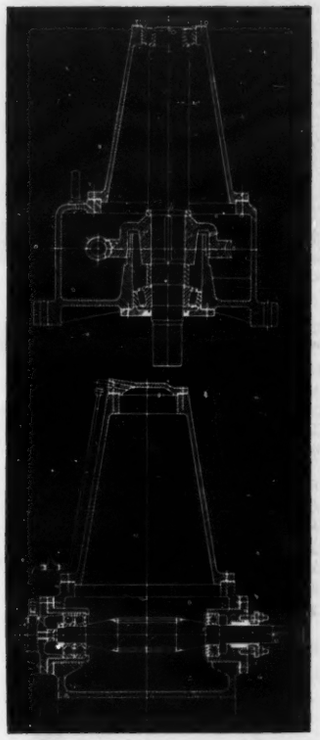


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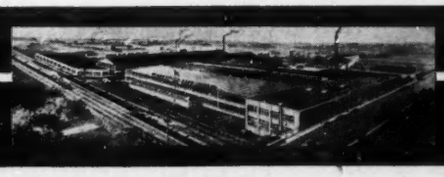
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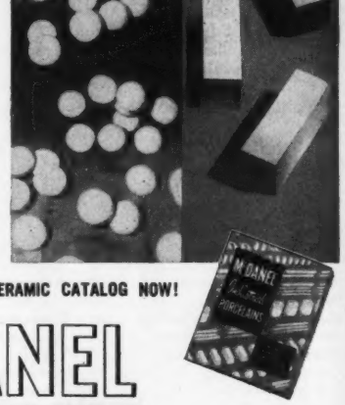
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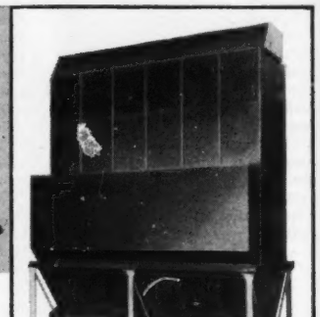
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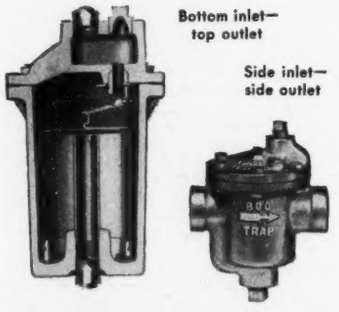
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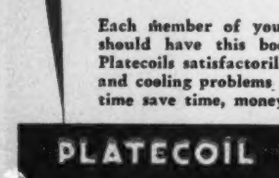
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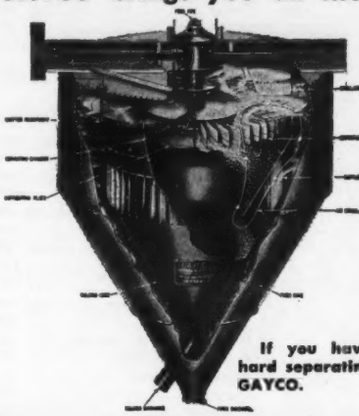
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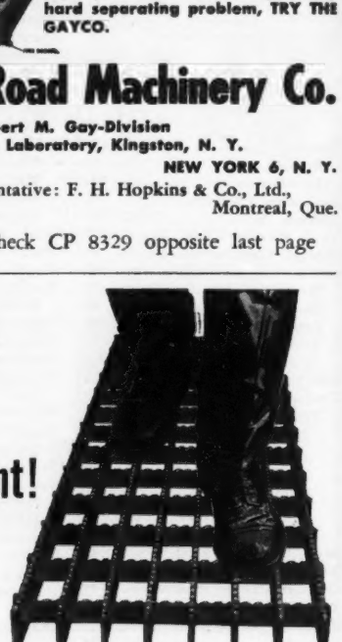
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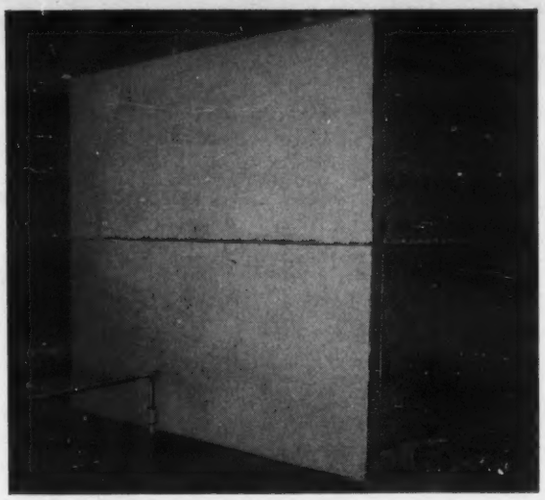
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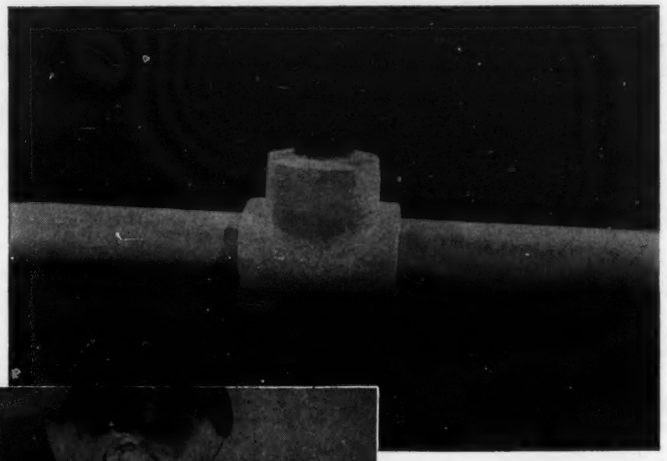
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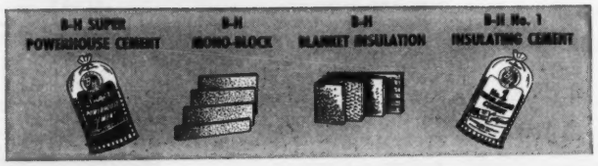




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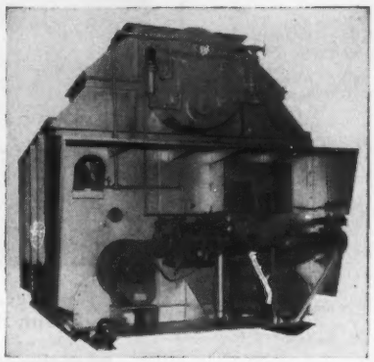
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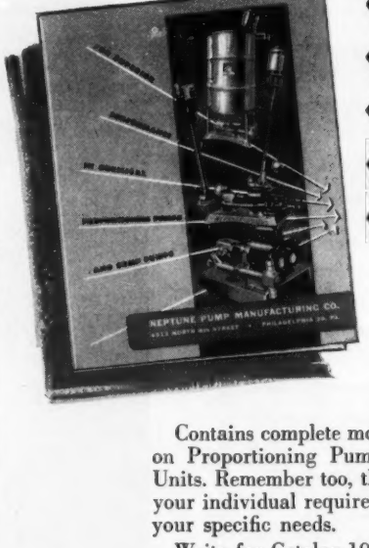
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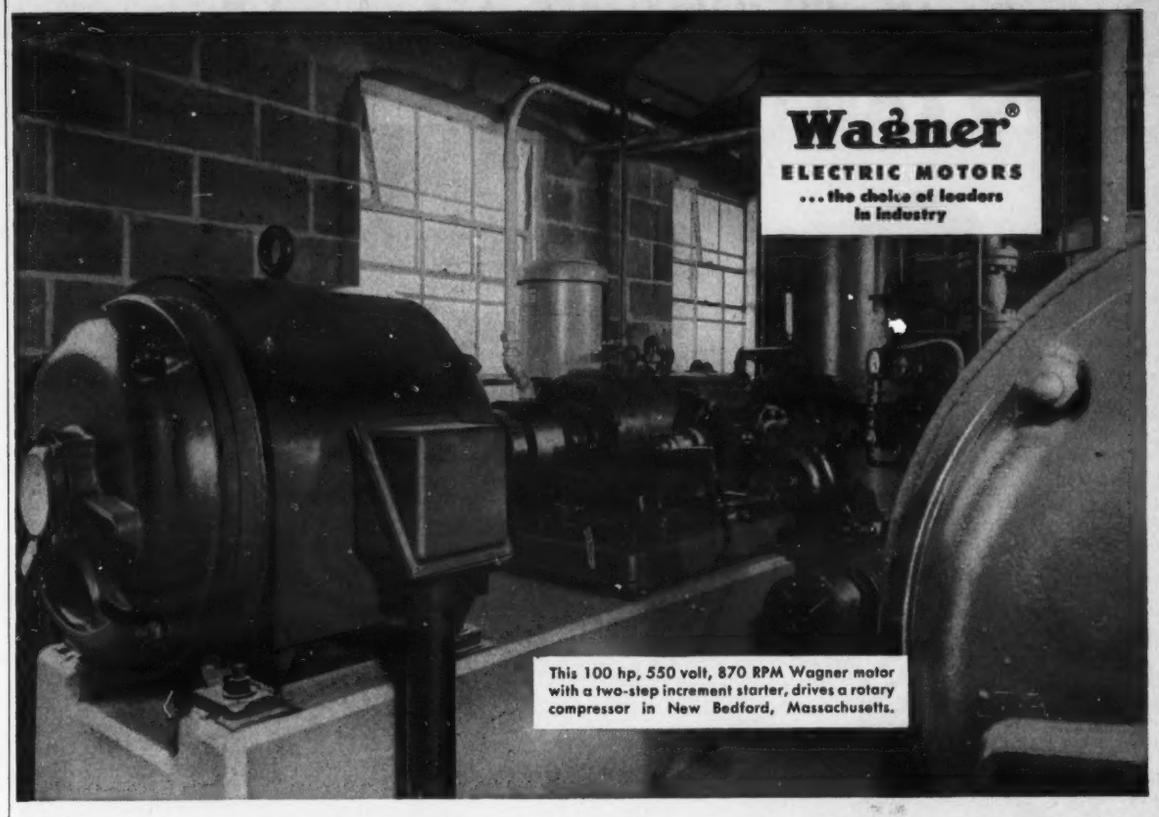
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Start large polyphase motors with minimum line voltage disturbance

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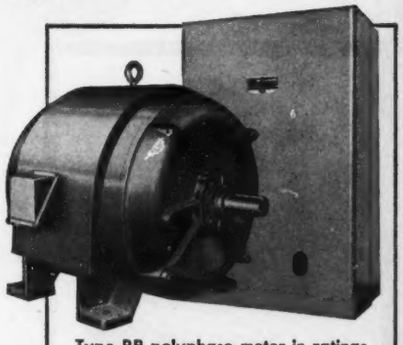
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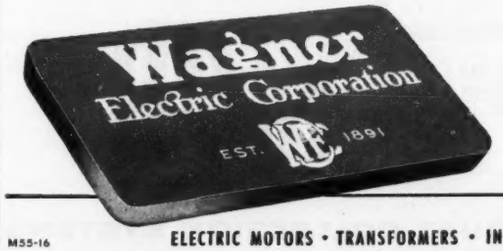
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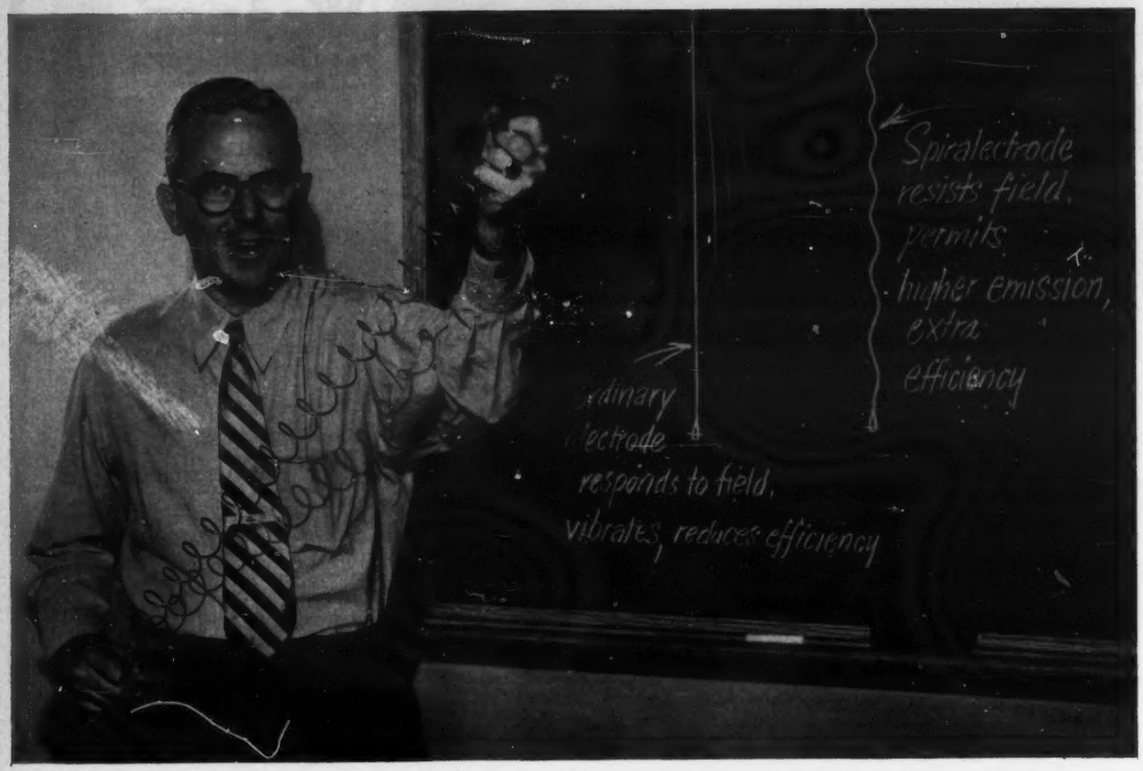
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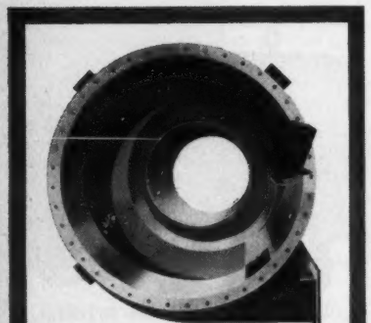
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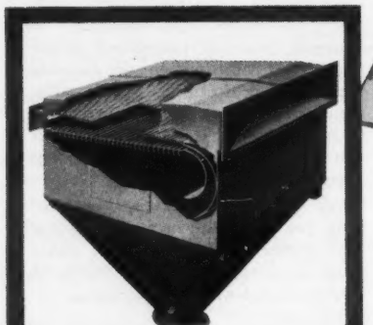
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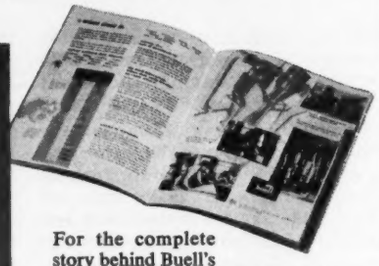
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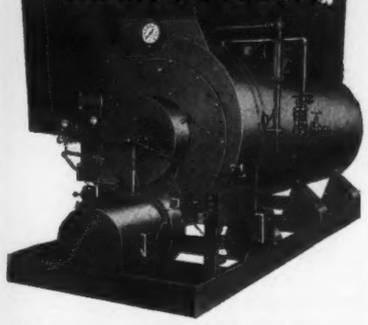
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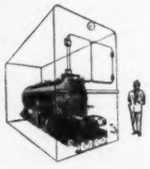
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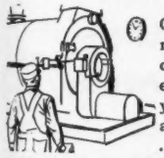
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☐	7920	Low-sodium Chemicals
☐	7921	Polyethylene Resins
☐	7922a	Carbonate of Potash
☐	7922b	Caustic Potash
☐	7922c	Liquid Chlorine
☐	7922d	Caustic Soda
☐	7922e	Paradichlorobenzene
☐	7922 f	Tetrachloro Phthalic Anhydride
☐	7922g	Trichlorethylene
☐	7923	Polyester Resin
☐	7924	Vinyl Plastisol Resin
☐	7925a	"Glycerine Alkyds Tailored to Need"
☐	7925b	Glycerine Standards & Specifications
☐	7925c	Glycerine Properties & Applications
☐	7926	Furfural
☐	7927	Dimethyl Sulfoxide
☐	7928	Biochemicals
☐	7929	Coconut Oil Fatty Acids & Methyl Esters
☐	7930	Adhesive Emulsion
☐	7931	Blue Pigment
☐	7932	Potassium Carbonate
☐	7933	Filter Presses
☐	7934	Filter Aid (state problem)
☐	7935	Stainless Tubing
☐	7936	Vinyl Coatings
☐	7937	Corrosion-resistant Cooler
☐	7938a	PVC Resins
☐	7938b	Tank Linings
☐	7939a	Corrosion-resistant Kettles
☐	7939b	Cooling and Vacuum Pans
☐	7939c	Corrosion-resistant Processing Equipment
☐	7939d	Corrosion-resistant Tanks
☐	7940a	Sprayable Foam Insulation
☐	7940b	Corrosion-resistant Coating
☐	7941a	V-type Packing
☐	7941b	Cup & Cone-type Packing
☐	7941c	Wedge-type Packing
☐	7941d	Pump Packing
☐	7942	Fingerprint Remover
☐	7943	Rust Inhibitor
☐	7944	Stainless Tubing & Pipe
☐	7945	Neoprene Coating
☐	7946	Polyethylene Tape
☐	7947	Unplasticized PVC
☐	7948	Clad Steel Equipment
☐	7949	Corrosion-resistant Enamels
☐	7950	Corrosion-resistant Paint & Primer
☐	7951	Glassed-steel Polymerizers
☐	7952	Aluminum
☐	7953	Protective Coatings
☐	7954	Porcelain Valves
☐	7955	Plastic Pump
☐	7956	Chemical-resistant Coating
☐	7957	Thickness-testing Gage
☐	7958a	Corrosion-resistant Primer
☐	7958b	Vinyl Coating
☐	7959a	Teflon Agitators
☐	7959b	Teflon Tees
☐	7959c	Teflon Engineering (state requirements)
☐	7960	Plastic Fittings and Pipe
☐	7961a	Glassed-steel Processing Equipment (state requirement)
☐	7961b	Mechanical Seals
☐	7961c	Stuffing Boxes
☐	7962a	Cupro-nickel Tube
☐	7962b	Cupro-nickel
☐	7963	Corrosion-resistant Coating
☐	7964	Ball Valve
☐	7965	Tank Car Linings
☐	7966	Corrosion-resistant Valves
☐	7967	Corrosion-resistant Valves
☐	7968	Neoprene-based Coating
☐	7969	Plastic Filter Press
☐	7970	Clad Metal
☐	7971	Ventilating System
☐	7972a	Chemical Pump
☐	7972b	Triplex & Multiplex Pumps
☐	7973	Welding Fittings
☐	7974	Liquid Meters (see coupon)
☐	7975	Diaphragm Valves
☐	7976	Stainless Clips
☐	7977	Coal Tar Epoxy Coatings
☐	7978	Plastic Pump
☐	7979	Protective Coatings
☐	7980a	Teflon Bearings, Bushings & Washers
☐	7980b	Teflon Rod, Tube & Cylindrical Shapes
☐	7981	Finned-tube Exchangers
☐	7982	Stainless Tubing & Pipe
☐	7983a	Asphalt Coating
☐	7983b	Aluminum Paint
☐	7984	Teflon-ceramic Seal
☐	7985	Corrosion-resistant Fasteners
☐	7985A	Plastic Spray Material
☐	7986	Corrosion-resistant Fittings
☐	7987	Glass Pipe
☐	7988	Magnesium Alloy Anode
☐	7989	Petroleum Sulfonates (state use)
☐	7990a	Heat-transfer Equipment
☐	7990b	Metal Fabrication (state requirements)
☐	7991	Aluminum and Steel Gratings
☐	7992	Chromium Carbides
☐	7993	Plastic Paint
☐	7994a	Sheet Filters
☐	7994b	Asbestos Filter Sheets
☐	7995	Corrosion-resistant Decorator
☐	7996	Corrosion Manual
☐	7997a	Plastic-lined Pipe & Fittings
☐	7997b	Plastic Tank Lining
☐	7997c	Plastic Molding Stock
☐	7997d	Plastic Tube & Fittings
☐	7998a	Plastic Fabrication
☐	7998b	Plastic Scrubber
☐	7999	Polyvinyl Chloride
☐	8000	Neoprene Lining
☐	8001	Titanium
☐	8002a	Corrosion-resistant Processing Equipment
☐	8002b	Pulping Digester
☐	8003	Unit Heaters
☐	8004	Lead Burning
☐	8005	Nickel Alloy Castings
☐	8006	Plastic Pipe, Fittings & Fabrications
☐	8007	Epoxy Coating
☐	8008	Sanitary Pump
☐	8009	Chemical Resistance of Polyethylene
☐	8010	Roller Chains & Sprockets
☐	8011	Chromium Plating Process
☐	8012	Chemical-resistant Linings
☐	8013	Globe Valve
☐	8014a	Hard Rubber Pipe
☐	8014b	Rubber-lined Tanks
☐	8014c	Non-metallic Acid Pump
☐	8014d	Rubber or Plastic Fittings
☐	8015	Rust-inhibitive Pigment
☐	8016	Plastic Structural Shapes
☐	8017	Solenoid Valve
☐	8018	Pipe Joint Compound
☐	8019a	Corrosion-proof Flexible Hose
☐	8019b	Solvent-proof Flexible Hose
☐	8020	Titanium Tubing
☐	8021	High-nickel Alloy
☐	8022a	Protective Coatings
☐	8022b	Caulking Compounds
☐	8023	Centrifugal Pumps
☐	8024	Packing for Liquid Caustics
☐	8025	Copper and Alloys
☐	8026	Safety Step Ladders
☐	8027	Protective Coatings
☐	8028	Glass Heat Exchanger
☐	8029	Corrosion-resistant Pumps
☐	8030	Corrosion-resistant Coatings
☐	8031	Chemical Drain Pipe
☐	8032	4-Way Selector Valve
☐	8033	Stainless Foils
☐	8034	Tygon Gaskets
☐	8035	Heating Elements
☐	8036	Plastic Pipe
☐	8037	Teflon Yarn Packing
☐	8038	Rust Prevention
☐	8039a	Filter Cloth
☐	8039b	Filter Paper
☐	8040	Acid-resisting Pump
☐	8041	Stainless Fittings
☐	8042	Zinc Coating
☐	8043	Alloy Fabricators
☐	8044	Rubber Linings
☐	8045	Titanium Shear Bolts
☐	8046	Chromium Diffusion Process
☐	8047	Diaphragm Slurry Pump
☐	8048	Fluorocarbon Polymer Dispersion
☐	8049	Vinyl Resin
☐	8049A	Plastic Pipe
☐	8050a	Welding Fittings
☐	8050b	Stainless Steel "Why & Where" Book
☐	8051	Zinc Coating
☐	8052a	Protective Linings & Coatings
☐	8052b	Field Service
☐	8053	Teflon Packing
☐	8054	Laminated Fiberglas Cracks
☐	8055	Swing Joints
☐	8056	Coated Tape
☐	8057	Plastic Drum Faucet
☐	8058	Corrosion-resistant Coatings
☐	8059	Corrosion-resistant Coating
☐	8060	Protective Coating
☐	8061	Stainless Fittings and Flanges
☐	8062a	Diaphragm Valve
☐	8062b	Pinch-type Valve
☐	8063	Flexible Metal Hose
☐	8064	Condensate Corrosion
☐	8065a	Asphalt-base Aluminum Paint
☐	8065b	Clay-type Asphalt Emulsion
☐	8066	Titanium Tube and Pipe
☐	8067	Liquid Pumps
☐	8068	Compressed-air Controller & Conditioner
☐	8069	Protection of Wood Cooling Towers
☐	8070	Hot-spray Vinyl Coating
☐	8071	Sandblasting
☐	8072	Plug Valves
☐	8073a	Pumps
☐	8073b	Pipe & Fittings
☐	8073c	Heat Exchangers
☐	8073d	Cascade Coolers
☐	8073e	HCl Absorbers
☐	8074	Neoprene Coatings (state which)
☐	8075	Submerged Combustion
☐	8076	Armored Multiple Tubing
☐	8077a	Heavy-duty and Non-clog Sump Pump
☐	8077b	Light-duty Sump Pump
☐	8077c	Condensed Pump Catalog
☐	8078	Teflon Thread-sealing Compound
☐	8079	Corrosion-proof Flooring
☐	8080	Teflon Gaskets
☐	8081a	Centrifugal Pumps
☐	8081b	Stainless Fittings
☐	8081c	Stainless Tube
☐	8082	Plastic Tubing
☐	8083	Heat-resistant Coatings (state application)
☐	8084a	Aluminum Floor Grating
☐	8084b	Contour Retainer Mesh
☐	8085	Stainless Steel
☐	8086a	String Discharge Filter

Be Sure To Give Your Address

See additional products and services on reverse side ——→

READER SERVICE SLIP *(Continued from reverse side of this sheet.)*

JULY, 1958

For more information on processes, controls or developments of products . . . note key number of staff-written editorial articles and advertisements that interest you . . . verify the key on this sheet . . . check space provided . . . fill in your name, title, company, main product and address below . . . mail to publisher's Reader Service Dept.

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☐	8086b	Horizontal Rotary Vacuum Filter
☐	8087	Mass Spectrometry
☐	8088	Cellulose & Derivatives
☐	8089	Applied Chemistry
☐	8090	Colloid Chemistry
☐	8091	Physical Chemistry
☐	8092	Internal Purifiers
☐	8093	Dry Materials Blender
☐	8094	Moisture Controller
☐	8095	Polyvinyl Chloride Resin
☐	8096	Totally-protected Motors
☐	8097	Food Irradiation Equipment
☐	8098a	Magnetic Drum
☐	8098b	Grate Magnets
☐	8098c	"Magnetic Ideas"
☐	8099	Industrial Aromatics
☐	8099A	Porcelain Tower Packings
☐	C100	Rotary Batch Mixer
☐	8101	Filter Press Closer
☐	8102	Mobile Electrostatic Precipitator
☐	8103	Celite Filter Aids
☐	8104	Liquid Flow Controls
☐	8105	Proportion Control
☐	8106	Pressure Gage
☐	8107	Pneumatic Transmitter (state type)
☐	8108	Water Analyzer
☐	8109	Millivoltmeter
☐	8110	Temperature Controller
☐	8111	Annunciator Systems
☐	8112	Desiccants
☐	8113	Pyrometer
☐	8114	Liquid-density Controller
☐	8115a	Recording Thermometer
☐	8115b	Anemometer
☐	8116	Counter
☐	8117	Humidity Control
☐	8118	Pressure Transmitter
☐	8119	Temperature Indicator
☐	8120	Control Valves
☐	8121	Air Conditioning Controller
☐	8122a	Surface-Temperature Thermometer
☐	8122b	Temperature Conversion Chart
☐	8123	Vapor-pressure Recorders
☐	8124	Miniature Rectifier
☐	8125	Final Control Elements
☐	8126a	Tektolog Recorder-controller
☐	8126b	Null-balance Recorder-controller
☐	8126c	Multi-point Recorder-controller
☐	8126d	Level-limit Control
☐	8126e	Continuous-level Indicator
☐	8127	Smoke-density Indicators
☐	8128	Differential-pressure Control
☐	8129	Liquid Tank Gage
☐	8130	Thermostats
☐	8131	Industrial Thermometers
☐	8132	Power Roof Exhauster
☐	8133	Pre-mixed Mortar
☐	8134	Direct-from-drum Pump
☐	8135	High-pressure Intensifier Unit
☐	8136	Pipeline Coupling
☐	8137	Windows
☐	8138	Clamps & Couplings
☐	8139	Valves (state which)
☐	8140	Pocket-size Tachometer
☐	8141	Eye Wash for Burns
☐	8142	Carboy Boxes
☐	8143	Solvent Recovery System
☐	8144a	Respirators
☐	8144b	Respirator Filters & Cartridges (state which)
☐	8145	Conveyor-lift Elevator
☐	8146a	Automatic Weighing Systems
☐	8146b	Load Measurement
☐	8146c	Torque Measurement
☐	8147	Catalytic Unloader
☐	8148	Oscillating Conveyor
☐	8149	Air & Electric Vibrator
☐	8150	Pneumatic Conveyor
☐	8151	Truck Leasing
☐	8152	Rotary Air Compressor
☐	8153	Pulsating Panel Bin
☐	8154	Chain Conveyor
☐	8155	Glue Dryer
☐	8156	Auto-Scoop Loader
☐	8157a	Liquid-level Controls
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☐	8157g	Time Delay Relays
☐	8157h	Auto. Reset Timers
☐	8157i	Electronic Timers
☐	8158	Tailgate Loader
☐	8159	Conveyor-Elevators
☐	8160	Pneumatic Vibrator
☐	8161	Leasing Plan
☐	8162	Weighing Machine
☐	8163	Bumpers
☐	8164	Sound-powered Telephone
☐	8165	Liquid-level Controls
☐	8166	Vibrating Conveyors
☐	8167a	Gas Trucks
☐	8167b	Worksavers
☐	8167c	Electric Trucks
☐	8167d	Hand Trucks
☐	8167e	Lift Truck Attachments
☐	8168	LP-gas Fork Lift Truck
☐	8169	Conveyor Coupling
☐	8170	Roll Feeders
☐	8171	Metal Gratings & Stair Treads
☐	8172a	Bin-flow Aerating Unit
☐	8172b	Bin-level Indicator
☐	8173	Submerged Oilless Bearings
☐	8174	Mobile Hoist
☐	8175	Air Conveyor
☐	8176	Tractor Shovel
☐	8177a	Liquid-level Gages
☐	8177b	Valves
☐	8178	Chemical Crushers
☐	8179	Solenoid Valves
☐	8180	High Tonnage Batching Scale
☐	8181	Gas Fork Truck
☐	8182	Rotary Airlock Feeder (state application)
☐	8183	Lined Steel Drums
☐	8184	Hi-speed Tandem Labelers
☐	8185	Brinsmaker
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☐	8186d	Jiffy Gun
☐	8187	Round-container Labeler
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☐	8189a	Ventilator-Exhauster
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☐	8193	Steel Flaring Pails
☐	8194	Steel Pails (state which)
☐	8195	Semi-liquid Filling Machine
☐	8196	Tape Dispenser
☐	8197	Vibrating Feeder
☐	8198a	Flexible Duct & Hose
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☐	8198c	Technical Data
☐	8198d	Application Data & Selector Guide
☐	8198e	Friction-loss Data
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☐	8202	High-velocity Burners
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☐	8206	Laboratory Mixer
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☐	8208	Manometer
☐	8209	Tensiometer
☐	8210	Rotating Vacuum-type Evaporator
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☐	8211b	Steel-head Ball Mill
☐	8211c	Classifiers
☐	8211d	Jaw Crusher
☐	8211e	Wet Reagent Feeder
☐	8211f	Disc Filters
☐	8211g	Flotation Unit
☐	8211h	Concentration Tables
☐	8211i	Laboratory Equipment
☐	8211j	Dryers
☐	8212	Laboratory Clamps
☐	8213	Particle Counter
☐	8214	Propellers
☐	8215	Micro-bellows Pump
☐	8216	Dial Thermometer
☐	8217	Lab Washer
☐	8218	Oxygen Analyzer
☐	8219	Mixers
☐	8220a	General-purpose Pumps
☐	8220b	Heavy-duty Pumps
☐	8220c	Underwriters Pumps
☐	8221	Gas and Vapor Analyzers
☐	8222	Visual Control
☐	8223	pH Meters & Recorders
☐	8224	Bottle Pumps
☐	8225a	Process Refractometer
☐	8225b	Infrared Analyzer
☐	8226a	Process Engineering
☐	8226b	Alkyd Plant
☐	8227	Fluid Energy Reduction Mill
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☐	8234	Dryers & Calciners
☐	8235	Duct Fans
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☐	8239	Applications of Aluminum
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☐	8242	Centrifugals
☐	8243	Mix Cookers
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☐	8244	Rotary Pressure Joint
☐	8245	Screening
☐	8246	Variable-delivery Pump
☐	8247	Spiral-wound Gasket
☐	8248	Plug Valves
☐	8249	Pipe and Tube Bender
☐	8250	Cleaning Compound
☐	8251	Dust Collectors
☐	8252	Liquid Indicator
☐	8253	Blast-cleaning Shot
☐	8254	Hydraulic Spray Nozzle
☐	8255	Filters (state which)
☐	8256	Dust Collector
☐	8257	Jacketed Gate Valve
☐	8258	High-pressure Gages
☐	8259	Waste Treatment Systems (state problem)
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☐	8262	Motor-pump Unit
☐	8263	Side-drive Mixer
☐	8264	Exhaust Fan
☐	8265	Temperature-actuated Regulating Valve
☐	8266	Dew Point Indicator
☐	8267	High-pressure Swivel Joints
☐	8268	Electric Pump Motor
☐	8269	Aluminum Jacketing
☐	8270	Speed-reduction Units
☐	8271	Cooling Towers
☐	8272	Dust and Fume Collector
☐	8273	Grease and Oil Remover
☐	8274	Progressing-cavity Pump
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☐	8282	Electrical Tapes
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☐	8288	Weed Killer
☐	8289	Piston Packing
☐	8290	Frangible Disc
☐	8291	High-speed Labeler
☐	8292	Silica in Polyesters
☐	8293	Welding Electrodes
☐	8294	Reinforced Plastic Tooling
☐	8295a	Crystallizers, Evaporators & Filters
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☐	8296	Sealing Service
☐	8297	Ion Exchange
☐	8298	High-temperature Insulation
☐	8299	Chemicals of Animal Origin
☐	8300	[illegible]-checking Wax
☐	8301	[illegible]ustrial Fans
☐	8302	[illegible]pray Nozzles
☐	8303	[illegible]oiler Water Conditioning
☐	8304	Timers
☐	8305	Gas-well Control System
☐	8306	Gas-engine-driven Compressors
☐	8307	Welded Tubing
☐	8308a	Gage Protector
☐	8308b	Valves
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☐	8310	Electron Microscopes
☐	8311	Pump Problems
☐	8312	Atomic Industry
☐	8315	Spectrophotometers
☐	8317	Lift-[illegible] Operator's Guide
☐	8318	Porc[illegible]ronze Filters
☐	8319a	Pres[illegible] Vessels
☐	8319b	Metal Fabrication
☐	8320a	Fractionating Towers
☐	8320b	Steel Fabrication (state requirements)
☐	8321	Pump Stuffing Box
☐	8322	Worm-gear Reducer
☐	8323	Odor Neutralizers (state application)
☐	8324a	Grinding Balls
☐	8324b	Mill Linings
☐	8324c	Industrial Ceramics
☐	8325	Suction-type Dust Collectors
☐	8326	Steam Traps
☐	8327	Plate-coils
☐	8328	Circulating & Coolant Pump
☐	8329	Centrifugal Separator
☐	8330	Serrated Grating & Stair Treads
☐	8331	White Insulating Cement
☐	8332	Ion Exchanger
☐	8333	Packaged Vaporizers
☐	8334	Liquid Pump
☐	8335	Motor-starter Combination
☐	8335A	Dust Collection & Recovery
☐	8336	Steam & Hot Water Generators
☐	8337	High-pressure Valves
☐	8338	Teflon Expansion Joints
☐	8339	Jacketed Gate Valve
☐	8340	Concrete Floor Patch
☐	8341a	Reactor
☐	8341b	Receiver
☐	8341c	Condenser
☐	8341d	Evaporator
☐	8341e	Storage Tank
☐	8342	Insulating Firebrick

Please type or print and be sure to give your title and main product of company

Name _____ Title _____

Company _____ Main Product _____

Street Address of Company _____

City _____ Zone No. _____ State _____

Fill in . . . mail to READER SERVICE DEPT., CHEMICAL PROCESSING

This is an Editorial Service — No Obligation

111 East Delaware Place, Chicago 11, Illinois



"Judging by the paper stacked here, I'd say we're over Washington, D.C., their capitol."

(*Continued from page 2*)

Paper maze

The Hoover Commission Task Force on Paperwork Management has estimated that Government offices are turning out about four million letters a day, or more than one billion a year.

> **This volume, with each piece stacked one on the other, would reach 390 miles into the stratosphere, some 25 times higher than man has flown.**

The Commission recommends a Government-wide paperwork management program that would apply "birth control" to paperwork at its source, with an initial annual saving estimated at $250 million.

Use of transistors in calculator cuts size and power needs

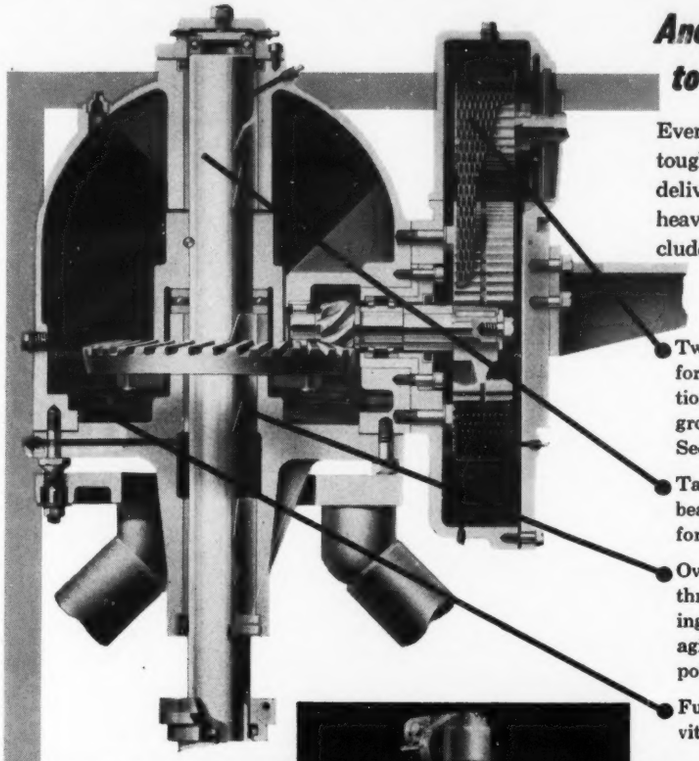
Experimental "all-transistor" calculator, recently developed by IBM, has a computing unit about one-half the size and requiring but 5% of the power needed for a comparable vacuum-tube unit. More than 2200 transistors mounted on some 595 printed wiring panels make up the machine's innards. Production and maintenance have been greatly simplified, yet the unit compares in capacity to the famous IBM 604 (which, incidentally, uses 1250 vacuum tubes.)

$1,275 every second

Absenteeism resulting from sickness and accidents costs American business 1275 dollars every second. This is the dollars and cents equivalent of 400 million man-days lost every year from temporary disability. These and other facts are reported in booklet — "Health and Maintenance for Greater Efficiency" available at 25c per copy from Superintendent of Documents, Washington 25, D. C.

Glascote reactors give you drives that

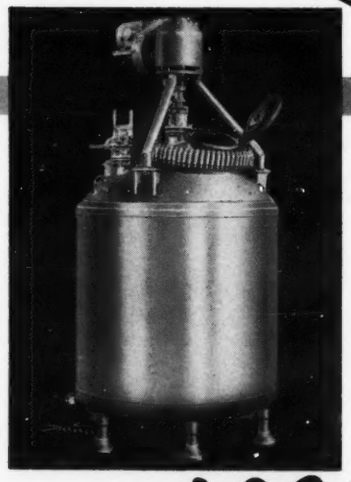
excel in heavy-duty operation



Another good reason why it pays to do business with Glascote

Every unit in Glascote's complete line of tough, precision-engineered drives is built to deliver remarkable dependability in your heavy-duty applications. These drives include V-belt types for laboratory reactors . . . variable-speed and gear-head motor drives.

- Two drive reductions transmit ample power for all agitator needs and speeds. First reduction is accomplished by hardened, precision-ground, spiral-bevel pinion and ring gears. Second is made by silent chain or helical gear.
- Tapered roller bearing and a radial roller bearing assure friction-free straddle-mounting for pinion shaft.
- Oversize vertical sleeve bushing and ball thrust bearing support the ring gear, mounting and agitator shaft. Positive alignment for agitator shaft assured by bushings at three points.
- Full bath lubrication means long life for all vital parts.



Equipped with dependable drives, Glascote reactors are available in a selection of sizes for laboratory, pilot plant and production applications. Your choice of glass-lined or alloy metals.

Ask the representative who calls on you for all the facts about Glascote products—reactors, receivers, condensers, evaporators, storage tanks and accessory products. Or, if you prefer, write direct. Glascote Products, Inc., Cleveland, 17, a subsidiary of A. O. Smith.

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Because of their high insulating values, B&W Insulating Firebrick can be supported or anchored with ordinary carbon steel. Expensive, heat-resisting alloys are not necessary.

REDUCE DOWN-TIME

These brick have low heat storage, cool off quickly. This makes possible quick access to the furnace for inspection. They heat up quickly to get back on the line, too.

CLOSE TEMPERATURE CONTROL

Due to the low heat-storage capacity of B&W IFB, their hot-face temperature responds quickly to changes in the rate of heat input to the furnace — insuring the closest possible temperature control.

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